Tampere University

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HYBRIDITY OF BIOECONOMY

Institutional Logics Shaping Goals and Performances in Bio-sector Hybrids

Faculty of Management and Business
Master´s Thesis
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ABSTRACT

Elina Vikstedt: HYBRIDITY OF BIOECONOMY - Institutional Logics Shaping Goals and Performances in Bio-sector Hybrids
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Transition to more sustainable circular bioeconomy is a wicked problem that requires collaboration across sectors and different disciplines. Hybrid ideal is that by collaborating organizations can innovate and create value beyond capabilities and resources of any single entity, and this idea has been widely adopted both in public and private agendas and strategies. The present study aims at capturing public, private, and third sector interfaces and institutional complexity of multiorganizational collaboration through the notion of hybridity. Hybrid organizations are organizations that incorporate multiple institutional logics, have diverse ownership structures, combine public and private sources of funding, and display varying forms of social and financial control.

The present study aims at understanding hybridity and interplay of institutional logics in macro-level by examining bioeconomy as an organizational field. This study also aims at exploring micro-foundations of institutionally complex environments by exploring how institutional logics of different actors' shape, challenge and enable goal setting and impact performance systems in boundary crossing hybrid arrangements. Empirical context in this study is bioeconomy in Finland. Research employed inductive grounded theory approach. Primary data was collected through semi-structured modified Delphi method interview through purposive sampling of experts with knowledge and experience of work in bio-sector hybrid organisations. Altogether eleven (11) bio-sector experts representing different organizations and sectors were interviewed for the study.

Institutional logics of capitalist market, environmental protection, scientific research and regional development are deeply entangled in bioeconomy, and both challenge and complement each other. Based on interview results, selective coupling and de-coupling of institutional logics were common approaches when dealing with divergent, sometimes conflicting logics. Experts described partner profiling and selection processes that were designed to ensure the combability of partners. Common challenges in combining different institutional logics were related to differences in organizational culture and time horizons, lack of motivation, disputes in distribution of credit, and territorialism that results from competitive tensions between the partners. Based on interview results, external influence plays a major role in resource-intensive innovation work and steers the way logics interact with each other. Performance systems should ideally reflect multiplicity of institutional logics present in the arrangement, but in practice they were often formulated to support accountability towards the funding body. Due to the small sample size, these results are not generalizable but offer in-depth insights and potential points of departure for future studies.

Keywords: Hybrid organizations, Hybridity, Bioeconomy

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LIST OF ABBREVIATIONS

ELY	The Centres for Economic Development, Transport and the Environment
ERDF	European Regional Development Fund
ILA	Institutional Logics Approach
KRNW	Knowledge Resource Nomination Worksheet
KPI	Key Performance Indicator
OKM	the Ministry of Education and Culture of Finland
PM	Performance Management
PPP	Public-private partnership
SE	Social Enterprise
SHOK	Strategic Innovation Clusters
SME	Small- and medium-sized enterprises
MMM	the Ministry of Agriculture and Forestry of Finland
VTT	Technical Research Centre of Finland Ltd.

1. INTRODUCTION

Changing the prevailing logic of our economic system is a wicked problem that no single entity can solve alone. Cross-sectoral collaboration is fundamental for solutions and innovations that drive change towards bio-based circular economy (Lewandowski, 2017). New pro-social and collaborative forms of organising public and private action against climate change are emerging, and innovation activities are becoming increasingly open, involving multiple stakeholders and heterogenous groups of actors (Weber & Khademian, 2008). Organisations are surpassing traditional silos in order to create new value-added products, innovations, knowledge, and ways to operate. Bioeconomy as a research- and technology-intensive field possesses idiosyncratic characteristics that encourage close collaboration between research, businesses and communities (Lewandowski, 2017). Private, public and research organisations are joining their forces and forming alliances. Public-private forms of collaboration are increasingly used as an inclusive governance instrument (Godenhjelm & Johansson, 2019).

Recent notions from the field of hybrid, network and ecosystem studies suggest that research paradigms are changing from rationalist and atomistic explanations towards plural and system-grounded views (Borgatti & Foster, 2003). At the same time, the lines between public and private are blurring (Boyne, 2002). Different modes of interorganisational operations are increasingly recognised as a source of competitive advantage for organisations (Borgatti & Foster, 2003; Dyer & Singh, 1998). Circular economy principles are targeting interest towards material flows and different side-streams: One company´s trash is another´s treasure, but in order to exploit previously underutilised material streams, organisations often need contribution of research and additional external resources and skills. Pooling resources, as well as exchange of knowledge and joint learning, have been recognized as important motivators towards closer collaboration (Kunttu, 2017).

Cross-boundary constellations are heterogenous, ambiguous, and often lack clear organisational structure. A whole piece of work could be dedicated around the typologies on supra-organisational patterns in public-private interface. In this research, collaborative arrangements are conceptualised as hybrid organisations: Types of organisations that combine different institutional logics in their operations and display varying levels of institutional complexity. Hybrid organisations are characterised with diverse ownership

structures, divergent modes of financing, varying forms of social and formal control, heterogenous goals and different, typically plural, institutional logics (Johansson & Vakkuri, 2017). Features of this type of organizing are examined in this study through Institutional Logics approach (ILA), which is widely accepted as grounding theory for research on hybrid forms of organising and institutionally complex arrangements (Skelcher & Smith, 2015).

Institutionally complex environments are understudied in organisational and managerial research. Polycentric multi-organisational, multi-actors, and multi-value structures are undertheorized and poorly understood due to their inherent complexity, lack of formal hierarchies, and sometimes hidden nature (Sotarauta, 2016). Managerialist dichotomies have formerly dictated the narrow way public, private and third sectors roles are understood (Hestad, Tàbara, & Thornton, 2020). As a result, there is clear lack of research, instrumental knowledge, and strategies that could aid organisations when dealing with plurality of values, conflicting institutional logics, multiple accountabilities, and knowledge- and power asymmetries that are inherent for multi-organisational and cross-sectoral arrangements (Ménard, 2003; Kunttu, 2017; Johansson & Vakkuri, 2017). If organisations are not able to overcome these challenges, hybrid organisations may suffer from various disorders that limit their collaborative capacity and block their innovation abilities. Organisations may become dysfunctional and fail to meet both policy-objectives as well as stakeholders' expectations.

The present study examines institutional logics and hybrid organisations in context of bioeconomy in Finland. The study focuses on cross-sectoral and multi-organisational arrangements in bio-sector. It aims to understand these institutionally complex environments and organisational systems through multiplicity of institutional logics present in them. The present works aims at identifying system level (macro-level) institutional logics and their interplay in bioeconomy, as well as their micro-foundations and dynamics in goal setting and performance evaluation, and their wider implications to hybrid governance. It does so by asking what institutional logics are present in bioeconomy development, what type of logics different actors possess, and how different and plural institutional logics influence goal setting and performance systems in bio-sector hybrid organisations? The present work is interested in challenges, as well as potential, in combining different institutional logics in hybrid settings.

2. RESEARCH SETTING

2.1. Research aims and objectives

The very definition of bio-based economy already entails a strong indication towards collaboration across traditional sectoral boundaries, and combination of market logic with environmental perspectives. Transition to bio-based economy demands new type of collective action to address complex environmental, societal and economic challenges, and calls for new inter- and transdisciplinary research and innovation (Lewandowski, 2017). According to McCormic and Kautto (2013), “innovation and research are seen as the keys to speed the transition to an economy that diminishes dependency on fossil fuels and ameliorates the sustainability of primary production and processing industries”. While the underlying logic behind bioeconomy may be simple – Replacing non-renewable materials with renewable bio-based materials – The change processes needed to transform the dominant logic of the global economy and driving sustainable change are much more complicated. Transforming the way our economic system works is a wicked problem that cannot be tackled by any single entity alone (Nylén, 2019). Different industries and public bodies must come together and collaborate to drive large-scale sustainable change (Ledowski, 2017). Developing industry clusters, innovation ecosystems, local and international networks and enhancing cross-sectoral cooperation are central components in policy and public strategies promoting bioeconomy. Several programmes have been launched to promote cross-sectoral collaboration within the European Union. Development of new cross-sectoral innovation ecosystems, partnerships, platforms and organisations is loaded with expectations and increasingly recognised as a strategic process both by private and public sectors.

The theme of this research was inspired by observations related to critical problems and issues in multiorganizational collaboration through personal work experience. I have taken part in few development projects and observed how organisations were challenged by their different operating principles and ambition levels. Organisations struggled to find right forms for closer collaboration and were challenged by lack of pre-existing legal and administrative frameworks and management models. Getting different stakeholders committed to work where every part is not equally meaningful for every stakeholder is clearly a challenge.

Development of effective collaborative arrangements is indeed not a simple task: According to a research project carried out by Finnish Pellervo Economic Research (PTT) and a Think Tank e2 on bioeconomy and its bottlenecks and steering mechanisms (Kniivilä et al., 2017), in order to promote the current strategy by the Finnish Ministry of Employment and the Economy several bottlenecks must be opened and removed. While changing the consumer behaviour and creating neutral regulation that aids in the economic transition are much needed, and a concrete and significant bottleneck recognised by Kniivilä et al. (2017) was lack of know-how and skills. Cross-sectoral multi-actor, multi-vision and multi-value cooperation poses many new intertwined organizational and managerial challenges, in which current management research does not sufficiently answer (Sotarauta, 2016). There are not that many experts with extensive work experience in multi-organisational settings, and even less training available on how actors can manage the system as a whole and make sure it works efficiently, or tackle common challenges associated with cross-boundary and cross-sectoral work.

Different stakeholders in bioeconomy have different, often parallel or conflicting visions and ambitions. Research discussions on the idiosyncratic differences of organisations and their operating principles in institutionally complex settings, combined with the idea that there is value in mixing these different logics together, are crystallised in concept of hybrid organisations. According to Pache and Santos (2013), hybrids are by nature arenas of contradiction. Organisations within hybrids are driven by different institutional logics that guide their operations (Johansson & Vakkuri, 2017). They have different ambitions and different values. They measure performance differently. On the other hand, according to Pache and Santos (2013), hybrid organisations may thrive in complex institutional environments, because they are able to incorporate institutional logics of several actors into their operations. Hybrid organisations have potential to create value beyond what any single organisational entity would be able to create alone (Ebrahim, Battilana & Mair, 2014). This ´hybrid ideal´, however, does not actualise in all types of arrangements. For example, Godenhjelm and Johansson (2018) noted that only 13% of multi-stakeholder public-private partnership projects for innovation resulted to new innovations. The question on how hybrids deal with their institutional complexity and evaluate their performance is therefore a critical one.

The present study is interested in field-level institutional logics, their interplay and their micro-level manifestations, and how actors with different actors can collaborate and agree on shared goals and create goal congruence in institutionally complex settings. The present study is also interested in how the resulting systems are evaluated. How different bioeconomy stakeholders with very different institutional backgrounds agree on system-wide performance? This study thus aims at capturing dynamics of institutional logics in two different levels: Field- or system-level and organizational level. The study is centres around following research questions:

1) What institutional logics are present in bioeconomy development and what type of logics different actors possess?

2) How different and plural institutional logics influence goal setting and performance systems in bio-sector hybrid organisations?

Overreaching aim of this research is to enable bioeconomy development and innovation through increasing understanding on governance and management of cross-sectoral, cross-boundary work. The study does so by examining bottlenecks that result from institutional complexity and creating better understanding on how institutional logics impact work and critical decision-making processes in bio-sector hybrid organisations. In academic sense, the aim of this research is to examine hybridity and institutional logics in empirical context and explore their dynamics in action in multi-stakeholder and cross-sectoral settings. The present study aims at comprehensively understanding hybridisation as a field-level phenomenon in bioeconomy. The objectives of this thesis include examining previously understudied highly ambiguous phenomena of multi-organisational multi-value forms of organising, gain insights of different bottlenecks and challenges idiosyncratic for hybrid arrangements, and increase current understanding on critical issues related to multiplicity institutional logics and their implications for hybrid governance.

2.2. Research methodology and approach

Research approach: Grounded theory

The present study is qualitative in-depth study. I used inductive grounded theory approach. According to Chun Tie, Birks, and Francis (2019), grounded theory is appropriate when little is known about a phenomenon that is being researched. Research on hybrid organisations, institutional complexity and institutional logics remain highly ambitious. Little is known about them in empirical context of this study, and the present work required system-analysis type of thinking and explorative, inductive take on data. At the beginning, I was unsure what I would find, what I should focus on, and what theoretical works could help in explaining the results. Literature was thus reviewed throughout the study, and constant comparison between data and literature made in analysis phase.

Empirical data collection: Modified Delphi method survey

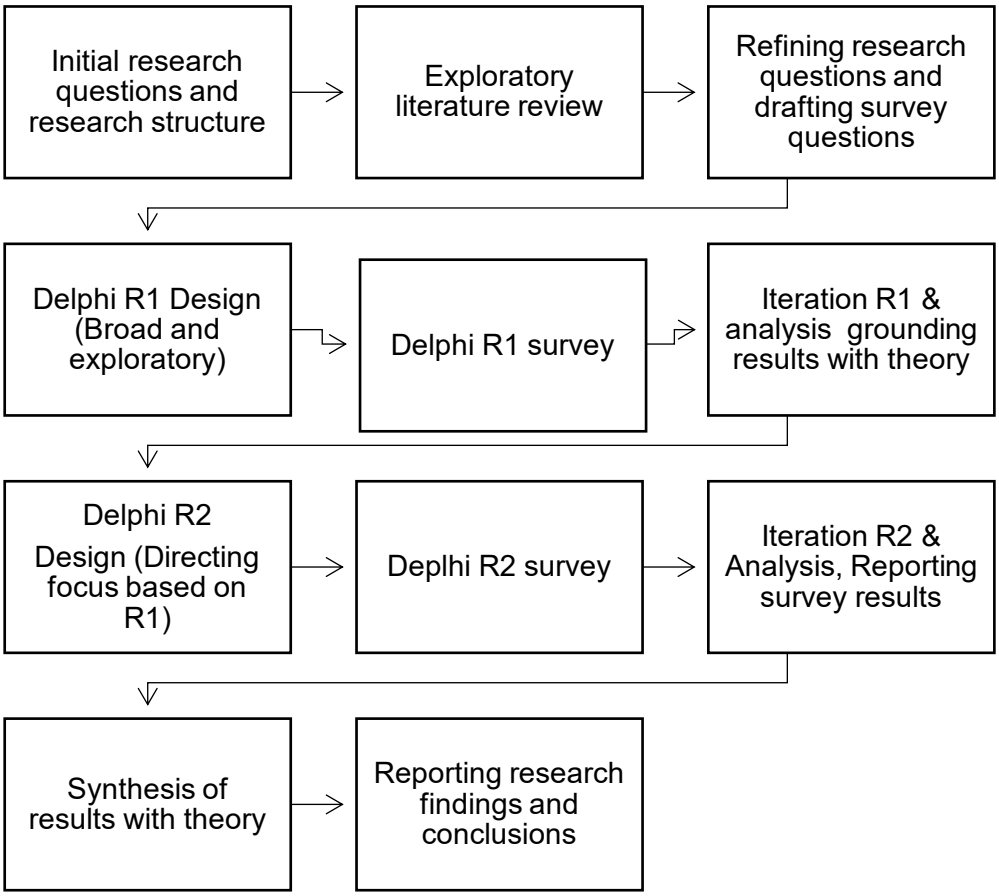
For the primary data collection, I used modified Delphi method semi-structured expert survey. Hsu and Sandford (2007, p. 1) define Deplhi method as “a group communication process which aims to achieve a convergence of opinion on a specific real-world issue”. The underlying rationale of the Deplhi method is that a group consensus is sounder than the opinion of an individual. In this method, a group or panel of experts are interviewed on a specific research problem on several rounds of expert panel interviews, during which the participants are free to refine their answers and engage in a structured dialogue about the research theme. The method can be employed for various purposes, including the generation of new values, ideas, and perspectives that can be used to support decision making and in various development processes: According to Kuusi (1999), Delphi method is useful expert technique in forecasting and projecting future development in long-term, in evaluating operational environment, in formulation of administrative objectives, and supporting decision-making both in private and in public sector (Kuusi, 1999; Hsu & Sandford, 2007). The method can be combined with other qualitative methods such as scenario analysis and cross-impact analysis (Kuusi, 1999), and it has been applied in various fields from programming to public policymaking (Hsu & Sandford, 2007; Linstone & Turoff, 2002).

The reason Delphi was initially chosen as a method for this research is that it by its definition it enables polyphonic dialogue on complex research topics that are not previously extensively researched and may lack clear definitions or are generally ambiguous: “Delphi may be characterized as a method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem.” (Linstone & Turoff, 2002, p. 3). Deplhi method is perceived as a suitable research method when dealing with uncertainty, complexity, and unformed and undefined open-ended issues (Linstone & Turoff, 2002), such as the topic of this research. According to Linstone and Turoff (2002), complex problems that cannot be solved with precise analytical techniques, but which benefit of collaborative problem-solving and collective judgement often lead to the need for employing Delphi method. The anonymity of the method helps in facilitating discussion on topics that could otherwise be politically unpalatable, such as challenges, direct obstacles and/or bottlenecks of cross-sectoral collaboration and cooperation. In this thesis, the identity of the experts was kept hidden, and as a result I hoped that the experts would feel free to bring forward even more difficult issues in hybrid collaboration. Deplhi method is also perceived to effectively prevent individual members of the expert pool dominating the dialogue and thus distorting the consensus (Linstone & Turoff, 2002; Hsu & Linstone, 2007), which I consider to be an advantage when the participant come from very different backgrounds and may have varying degrees of academic education and/or professional experience.

Delphi design and structure

This research consists of four stages that are designed according to general methodological guidelines and research approach. The nature of Delphi research is often explanatory (Skulmoski, Hartman, & Krahn, 2007), and the research consists of multiple rounds. Two or three round iteration rounds are considered sufficient by most authors (Skulmoski, Hartman, & Krahn, 2007). For the scope of this study, I consider two rounds of iteration as sufficient, and used slightly modified method. Research design and structure is presented in Figure 1.

Figure 1. Research design



In the planning stage (S1) initial research questions were structured based on background studies and review of relevant literature in early stages of research process (Figure 2.). Broader, exploratory literature review was conducted based on themes identified in early review. After the exploratory literature review and initial screening research questions are refined and themes and interview questions for first round of Deplhi survey specified.

The second stage (S2) of the research consists of Round 1 of the Delphi surveys. Interview subjects were selected based on re-defined sampling criteria; subjects were screened for their willingness to participate in this study by contacting potential research candidates via email until the target sample size was reached. After finalising expert selection and interview questions, interviews were submitted to research participants (R1). The first round was conducted 04.05.2020.-22.06.2020 through personal interviews by phone, face-to-face meetings or Teams. Interviews lasted from 30-60 minutes. All interviews were conducted in Finnish. The participants were presented list of initial questions before interviews and given

time to consider research themes. Interviews were conducted in semi-structured manner, and questions were used as discussion points. Participants were asked to comment some points that other participants had brought forward and comment the themes freely at the end of interview. The purpose of R1 was to create broad understanding how experts perceived hybridity in bio-sector and what type of arrangements were understood as hybrid; what different institutional logics there are perceived to be and how different institutional logics shape the field; and how hybrid organisations negotiate their goals and agree on their performance objectives.

After R1 surveys, the initial results were analysed and synthetized. In the third stage (S3) second round (R2) with R1 result summary (5 pages) was released for the participants. Participant had a commenting period from 22nd of June until 9th of August. R2 surveys contained additional questions, and request to comment results from the R1 interview. Participants had an opportunity to reflect R1 results, suggest corrections and discuss themes. Commitment of participants was measured with round-by-round response rate. In R2, only five out of total eleven participants provided their comments.

Sampling methods

Grounded theory approach often employs purposive sampling (Chun Tie, Birks, and Francis, 2019), which was considered suitable approach for this study. Purposive sampling means choosing interview participants that can answer the research question, in this case individuals with experience from hybrid type of organisations. Selection process of research participants is one of the most critical questions when designing a Delphi survey (Skulmoski, Hartman, & Krahn, 2007). Participation process and definition of an expert is not clearly defined, but sample should be heterogenous enough. Okoli and Pawlowski (2004) suggest using Knowledge Resource Nomination Worksheet (KRNW) in expert selection. Employing this approach, in the first phase was to prepare KRNW by identifying (1) relevant disciplines and skills, (2) identifying relevant organisations, (3) identifying relevant academic and practitioner's literature. The third category I decided to name as research and projects, and I attempted to categorise projects and research based on sector/organisation responsible for them. I used Biotalous.fi online platform and organisations listed as a participants of

Finnish National Bioeconomy panel as points for departure. Complete KRNW is represented in the Appendix 1. of this study.

In the second phase of drafting KRNW, categories were populated with names of potential participants, starting often with convenience sampling approach from personal contacts, but moved to finding persons with right qualifications from organisations websites, and sometimes through secondary sources like media articles about bioeconomy related collaborative projects or organisations. According to Kuusi (1999), when evaluating expertise of an individual participant following features can be considered: (i) experience, professional expertise and skills, (ii) innovativeness and creative thinking, (iii) participants ability to recognise patterns and (iii) referrals and recommendations and opinions of other participants. Skulmoski, Hartman, and Krahn (2007) have proposed expert selection criteria to include i) knowledge and experience with the issues under investigation; ii) capacity and willingness to participate; iii) sufficient time to participate in the Delphi; and, iv) effective communication skills. For this study, I considered (i) experience, expertise, skills and know-how: Professional experience, education background, current and past positions; (ii) involvement in cross-sectoral work: Participation in multi-partner research projects, direct involvement with industry or interorganisational partnerships, participation in industry-organisations and new business development; (iii) referrals from other participants: Referrals made by other candidates are interpreted for the favour of the candidate; and finally, (iv) willingness and capacity to participate: Accessibility and responses to initial research enquiries. Snowballing method was used to widen the pool of potential participants and to reduce personal bias of utilising own personal network in participant selection (Skulmoski, Hartman, & Krahn 2007). Each participant was asked to recommend other potential participant(s). Overlap in categories is to be expected. In some cases, initial contact was made on certain department or faculty, because individual contact details were not available. Altogether 55 experts were identified, out of this pool, 14 experts were referred by interview subjects (snowball sampling) and 38 experts were identified based on KRNW. Invitation was sent to all of these 55 experts. In addition, three organisations from which I considered relevant for this study but failed to obtain contact information for suitable interview candidate were reached through generic channels.

Recommendations on appropriate sample size vary: Okoli and Pawlowski (2004) used multi-group approach where participants are categorised based on their background to different

research groups and considered ten participants per group as a minimum and used three different groups which were put to interaction in multi-levelled process first to reach group consensus. Skulmoski, Hartman, and Krahn (2007) state that in homogenous samples fifteen participants may be enough, but large international studies may require several hundred participants. In specific cases where expertise pool is very limited, even much smaller samples may be acceptable. Large sample size is considered to increase reliability of the findings. Based on general recommendations and the scope of this study, initial target sample size was between 10-20 experts from different organisations, representing different sectors. Out of 55 invited experts, eleven (11) were willing to participate into this study. Out of these eleven, four (4) of the participants were selected based on referrals by others. Two (2) additional background interviews were conducted. Altogether empirical data was collected from 15 subjects. List of organisations represented in this study can be found in Appendix 2. Interviewed experts represented following organisations: Public research institutions (Luke Natural Resources Institute Finland, VTT Technical Research Centre of Finland Ltd), quasi-public strategic innovation cluster (CLIC Innovation Oy/Ltd), and research and education (Bioeconomy Institute of Jyväskylä University of Applied Sciences), industry associations (The Bioenergy Association of Finland (Bioenergia ry) and Finnish Food and Drink Industries Federation (Elintarviketeollisuus ry)), business hubs (Smart Chemistry Park Turku Business Hub, Plänet B (Äänekoski ecosystem for bio-innovation), and ECO3 Circular Ecosystem Park (Nokia, Verte Oy/Ltd)). Additional supportive interview on selected themes was provided by an expert from the Baltic Institute of Finland, and an expert from Tretorg AS.

2.3. Data analysis methods

Grounded theory suggests constant comparative analysis between data and theory (Chun Tie, Birks, and Francis, 2019). Interviews were transcribed into text format. Results were analysed through qualitative analysis methods, mainly thematic analysis. In R1, inductive, latent approach was used. In the coding phase, no predetermined set of codes were used. Data was scanned for recurrent and interconnected themes (concepts, phrases, terms, and ideas), that were reflected against theoretical background through comparative and reflective analysis. Although discussions followed semi-structured form and research questions were arranged based on research themes and research questions, all data was combined into one data pool and answers analysed across different themes. Preliminary codes were created based on first analysis. In the second phase, these were refined and connected into their corresponding thematic entities and combined into specific sub-themes. Codes and thematic entities are represented in Table 1.

Table 1. Thematization of data and identified codes

Thematic entity	Sub-theme	Codes
Finnish bioeconomy	Bio-sector in Finland	**Forest-centricity** **Natural resources** **Unclear boundaries** **Multi-sector/multidisciplinary** **Role for national economy**
Hybridity in bio-sector	Role for bio-sector	**Value-added products** **Innovation** **Bioeconomy development**
	Drivers of hybridity	**Political agenda** **Contemporary work culture** **Organisational survival** **Value added products** **Competitive advantage** **Organisational learning** **Matching supply and demand** **Rapid commercialisation**
	Types of hybrid organisations	**Industrial symbiosis** **Project organisations (triple-helix)** **Innovation platforms**
	Institutional logics	**Corporate for-profit** **Scientific Research** **Environmental protection** **Regional development**
Goal setting in hybrid organisations	Critical issues and approaches to multiplicity of institutional logics	**Shared goal** **Partner selection** **Goal congruence** **Selective coupling** **Compromising** **Institutional work and role of agency**
	Challenges in joint goal setting	**Financing body leads goal setting** **Cultural distance** **Lack of motivation and silent partners** **Competitive tensions between partners** **Differences in time horizons**
	Instruments and practices	**Partner selection** **Boundary objects** **Structured dialogue**
Performance management in hybrids	Current state	**Project centricity** **External influence** **Autonomous evaluations**
	Critical issues	**Time horizons** **Heterogenicity of measurement systems** **Distribution and representation of data**

2.4. Limitations and ethics

Institutional logic as a concept is multifaceted, and logics are often embedded and hidden in mundane practices and protocols, symbolic and material objects, and individuals understandings of the surrounding system. Transcribing the concepts and formulating the research questions was a critical point. Furthermore, the interviews were conducted in Finnish and data was then transcribed in English. Potential errors or changes of meaning may have occurred during the translation phase. Different understandings of difficult and ambiguous concepts may generate different insights and results from the subjects. This study only described dynamics of institutional logics and institutional work that the experts were able to identify. As noted earlier, institutional work is not necessarily conscious effort and the ways in which new hybrid orders are developed is often hidden in daily activities and people simply ´trying to get the job done´. Thus, this study only focuses on more apparent aspects which the actors are aware of themselves.

Subjects of this study gave their consent for recording the interviews. Maintaining complete anonymity of the interview subjects is vital for research ethics, and research design should support anonymity at all stages of the process. Details of organisations were faded out from the comments that were published. Interview subjects were informed that the names of the organisations that are represented in this study will be published as a list, but details of corresponding organisations would not be evident from any individual comments.

While Delphi-method can offer number of valuable insights into specific complex topics, it has also been criticised. The main criticism argues that expert judgement is not necessarily always accurate, and consensus between the experts does not guarantee validity of the results (Kuusi, 1999; Skulmoski, Hartman, & Krahn, 2007). Sampling of the experts is also a very central question and crucial to the validity of the research results. Kuusi (1999) emphasised that if the panel is homogenous, results are likely to be homogenous. Kuusi (1999) also notes that Delphi is based on the idea that experts will really use their expertise and share best-of-their-knowledge information. One of the clear limitations in sampling is that typically it is recommended to start snowballing the sample from the researchers own

personal network, which may increase homogeneity of the sample. Elimination of this bias is attempted through referrals and KRNW approach by Okoli and Pawlowski (2004).

Sample size in this study was small, and the study employed purposeful sampling. Thus, the discussion of to what extend the results can be generalized is an important one, and Skulmoski, Hartman, & Krahn (2007) recommend the findings generated by using Deplhi technique to be verified in additional research and by other research methods. Due to the scope of this research, verification with additional research methods is not a feasible option, so further studies are needed for empirical validation. Validation is done through secondary data and grounding findings with existing research literature. Critical parts from the perspective of research ethics are researcher's interpretation of data when using grounding the theory. Nevertheless, the results of this study are not generalisable to the field without additional validation, and neither they can be generalised to explain hybrid governance in general. Results should be interpreted as in-depth insights and potential points of departure for future research.

3. HYBRIDITY IN GOVERNANCE AND ORGANISATIONS

3.1. Configurations of hybridity and hybrid organisations

Several open system streams of organisational research have become increasingly interested in cross boundary arrangements and multiorganizational collaboration. Different conceptualisations, such as organisational ecosystems, knowledge ecosystems, innovation ecosystems, industrial clusters, meta-organisations, hybrid organisations, interorganisational networks and knowledge networks have been proposed. Many of these have become buzzwords in recent years, and sometimes these definitions are used almost synonymously. Despite the similarities in the conceptualisations of cross-boundary arrangements, these parallel streams of academic research present different organisational schools of thought when traced back into their theoretical origins (Knoke, 2018). Each stream provides interesting perspectives and points of departure for theorising on multiorganizational arrangements, but at the same time myriad ambiguous conceptualisations challenges research on cross-boundary arrangements. The present work is interested in institutionally complex environments in bio-sector, which are the focus in the stream of research on hybridity and hybrid organisations.

Hybrid organisations, as already stated, incorporate both public and private (or markets and hierarchies, for-profit and non-profit) institutional features, such as mixed ownership and logic of governance, both public and private funding, and public and private forms of social and financial control (Johansson & Vakkuri, 2017, p. 3-4). Johansson and Vakkuri (2017, p. 3) note that the concept of hybrid organisation is indeed an ambiguous one, and can entail multiple different arrangements – Everything from government-owned corporations, public-private partnerships (PPPs), social enterprises (SE), commissions, public procurement, purchase provider models, contracting out, to private organisations working for public provisions or public organisations mixing private governance logics into their activities. The definition of hybridity is founded on Institutional Theory by DiMaggio and Powell (1983), although stream of hybrid research has been influenced by number of other theories, including neo-institutionalist streams of research, network theory, transaction-cost economics and theory of agency.

Despite myriad theoretical influences, hybrid research is interested in how institutional logics shape organising principles and influence activities of individual, groups and organisations. Skeltcher and Smith (2014, p. 436) propose Institutional Logic Approach as a grounding theory to explain hybridity, because it enables theorising on hybridity as “a non-exceptional but not necessarily universal event” and allows pluralistic understandings to multiplicity of logics that prevail in hybrid settings. According to the authors, literature on hybridity has suffered epistemological and ontological unclarities, which has led to debates whether we should theorise on hybridity in the first place. Traditionally, hybrids have been placed into state-market-community or public-private-third sector triptych. They have been perceived as strange, rare, and exception form of organising, anomalies of organisational world that combine public and private principles. On the other hand, through enquiries whether anything purely private or purely public exist, it has been proposed that nearly all organisations can be perceived to be hybrid in some level. Rather than placing hybrids somewhere in this triptych or perceiving them as ´a third category´ in-between public and private, Skeltcher and Smith (2014) propose that hybridity should be understood as a combination of these categories. Hybridity in its essence is not either or, but both, in a new way.

In the present work, I will build on the views by Johansson and Vakkuri (2017) and Skeltcher and Smith (2014) and understand hybrid organisations as types of organisations that *combine* different institutional logics and where aim is that these logics together aim to capture something *beyond* any single dominant logic. This conceptualisation means that study of hybridity goes beyond organisational boundaries or taxonomic classification of organisational forms, and instead focuses on melding of institutions, practices, rituals, and concept through interaction and clashes of competing and complementary institutional logics (Millar, 2014). Research on organisational hybridity is deeply rooted in institutional theory and concerned with how institutional logics, including values and shared beliefs, patterns of action and material practices, shape organisations and individual agency in organisations. As a result, as Johansson and Vakkuri (2017) noted, hybridity works simultaneously in macro- (large systems, economies, states), meso- (organisational fields, systems and networks), and micro-levels (organisations or individuals), and is not limited to, or even developed to portray organisations in structural sense. Instead, hybridity focuses on how institutions shape organising principles and organisational outcomes.

3.2. What drives organisations to cross their boundaries?

How multi-organisational hybrid organisations come to be, and what determines how they are shaped? When do firms cross their traditional boundaries? Where are borders of the system placed? Configurations of hybrid organisations, and in more general level, other arrangement that cross organizational boundaries, have been inspired by multiple different streams of organisational research and theories (Knoke, 2014). Transaction-cost-economics -based (TCA) view argues that at certain situations, crossing organisational boundaries simply makes sense: Governance decisions are adopted in *make, buy*, or *ally* -approach (Kunttu, 2017). Hybrids do exist to bundle and create resources and capabilities that an organisation could not achieve alone. Choice between hierarchical or market governance is based on which of these costs less, and organisational boundary set to the point where the overall costs are the lowest (Kunttu, 2017). In TCA approach, boundary setting is a rational managerial choice.

These perceptions have been complemented with the Resource-Based view (RBV) (Barney, 1991) and the Resource-Dependence view (RDV) (Pfeffer & Salancik,1987). Firms cross sectoral and organisational boundaries and create hybrids to develop their own strategic capabilities and resources, and through them organisations can create sustainable competitive advantage (Kunttu, 2017). Dryer and Singh (1998) speak of relational rents as a result of interfirm linkages, and relational ties as sources of competitive advantage: It is no longer one single organisation against another single organisation, but network against network, as relational-specific assets are often very difficult to imitate and thus perceived to generate sustainable competitive advantage. Kunttu (2017) further argues that firms internalise the activities that are vulnerable to opportunistic behaviour by markets or partners. In knowledge- and technology-intensive fields such as bio-sector, motivation to collaborate can be related to developing interfirm innovation capabilities, but risks associated with knowledge-sharing inhibit organisations willingness to engage in cross-boundary work. The opposite perspective, Resource-Dependence view (RDV) (Pfeffer & Salancik,1987), argues that organisations cross their boundaries to gain access to external resources that are central for their survival, mainly driven by environmental uncertainty. Pooling resources is viewed as a way to deal with significant uncertainties and to survive in

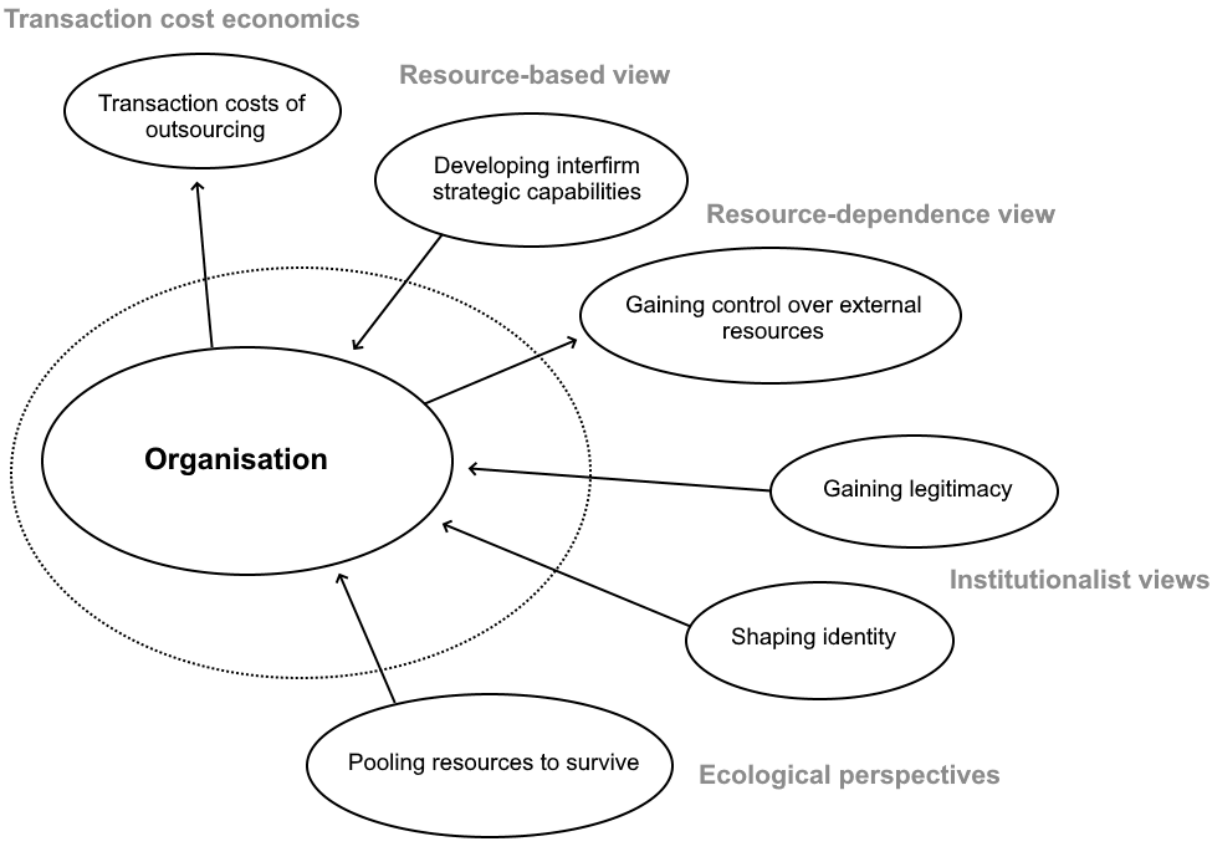
rapidly changing environment (Ménard, 2004). Gaining access to laboratory test equipment that the organisation would not be able to invest on its own, for example, may motivate a firm to collaborate with research institutions. These ideas are connected with ecological theories of organisations.

Previously reviewed schools of thought focus primarily on market dynamics. Institutionalist views state that organisations mix institutional logics to gain legitimacy and adopt different institutional logics to cope with environmental uncertainty. Organisations become to resemble each other through processes of institutional isomorphism (DiMaggio & Powell, 1983). Collaborating and interacting organisations form organisational fields and become "infused by values beyond technical task at hand" (DiMaggio & Powell, 1983, p. 148). According to DiMaggio and Powell (1983) homogenisation, or institutional isomorphism, takes place when organisations face similar environmental conditions. Coercive isomorphism occurs when organisations adopt homogenous practices and models in order to gain legitimacy. This could be used as an explanatory model for many social enterprise types of hybrids: A classic example is a non-profit organisation that adopts principles from business-field in order to raise funds for social action and to convince external stakeholders. Neo-institutionalists employ some ideas from the original theory but argue that institutions are persistent over time and organisations may mix different institutional logics in their operations to gain legitimacy and deal with external uncertainties. For example, a non-profit organisation may adopt features of a for-profit business to generate more funds for pro-social works, and to be able to more easily interact with for-profit businesses who work as sponsors. Skeltcher and Smith (2014) examined these types on non-profits in U.S and typified them based on how they applied mixed institutional logics in their operations. Another example related to hybrid research is a concept of shared value (Porter & Kramer, 2011). Business organisations are suffering legitimacy crisis due to profit-maximisation on the expense of the surrounding society, so Porter and Kramer (2011) suggest that businesses should adopt societal goals as a core of their operations in order to regain legitimacy. Dyllick and Muff (2016) propose similar adaption of sustainability challenges as a core of business operations.

Kunttu (2017) notes that relying on any single explanations on why organisations cross their boundaries and form hybrid operations does not likely reflect complex reality of organisational life. Boundary considerations are complex, and some recent studies have

investigated interplay and interconnectedness of these considerations. Motivations behind crossing sectoral boundaries are likely influence by efficacy, survival, power, competence, legitimacy and identity considerations all simultaneously (Kunttu, 2017). These different perspectives are integrated in Figure 2. Nevertheless, when sectoral boundaries are crossed, the resulting constellation is typically an institutionally complex arrangement, hybrid organisations.

Figure 2. Why organisations cross their boundaries? Integrative approach, modified from Kunttu (2017)



3.3. Institutional Logics Approach in study of hybridity

Institutional logics approach

Institutionalist views are founding theories for research on hybridity. Despite DiMaggio and Powell (1983), neo-institutionalist observed that institutional environments remain complex, and developed Institutional Logic Approach (ILA) to explain this institutional complexity. Institutional logic as a concept was introduced by Friedland and Alford (1991) and builds on the traditional institutionalist school of thought. According to Institutional Logic Approach (ILA), human society consists of institutions: In the original work by Friedland and Alford (1991), these were the capitalist market, the bureaucratic state, families, democracy, and religion. The understanding of different institutions has since been developed and broadened. Despite different typologies, prejudice in institutional logics accounts that the society consists of heterogenous institutions, which guide social action. Each institutional order has its own central logic that guides its organizing principles, including frames, symbols and practices that direct organisational behaviour and actions of individual actors, and constrain social action in organisations. Institutions, according to Friedland & Alford (1991, p. 243) are supra-organizational patterns of human activity, "by which individuals and organizations produce and reproduce their material subsistence and organize time and space". Institutionalised frames, symbols and practices, values and ways to organise time and space are vastly different if one compares for example organisation like university with a start-up enterprise.

Thornton and Ocasio (2008, p. 101) conceptualised institutional logic as "the socially constructed, historical patterns of material practices, assumptions, values, beliefs, and rules by which individuals produce and reproduce their material subsistence, organize time and space, and provide meaning to their social reality". According to Thornton and Ocasio (2008), institutions, through their underlying logics of action, shape heterogeneity, stability and change in individuals and organizations. In short, they influence organising principles and dynamics of organisational change. Hybrid organisations, according to Pache and Santos (2013) are in a way contradicting the pure forms institutional logic approach that presumes one dominant logics as an explanatory model for organisational behaviour. Hybrids by their definition are institutionally complex environments that combine multiple

different logics. In multiorganizational, cross-boundary settings logics of for-profit business, academic research, public administration and local society interact and shape each other and the ways in which the resulting organisational constellation is formed. Individuals also play important role in these change processes. According to ILA approach and especially some more recent enquiries, individual agency has limited but clear capacity to change institutions. These dynamics are captured in stream of research focused on institutional work, actor-network theory and institutional entrepreneurship. Individuals are socialised in institutional orders and absorb institutional logics of the institutions they interact with. In multiorganizational settings, individuals work as carriers of the institutions they are involved in, as suggested already in works of DiMaggio and Powell (1983).

For the sake of conceptual clarity, it should be noted that not all ´logics´ in organisations are institutional by nature. Institutional logics are deeply embedded and sometimes hidden patterns, which also make them challenging subject to study. It also should be noted that although the classical approach describes distinct logics of different institutions, even within a single organisational entity parallel or contradicting institutional logics may be present. These situations have been described in hybrid literature for example by Reay and Hinings (2009), Skelcher and Smith (2015) and Ebrahim, Battilana, and Mair (2014). Logics are messy and, maybe far from their ideal types. Different institutional logics have been recorded co-exist for long periods of time in hybrid arrangements. Reality of institutional logics is thus much messier than the original theory suggests and entangled in daily and mundane activities.

Institutional work: Exploring dynamics of complex institutional change

Hybrids, due to their idiosyncratic characteristics, cannot be led or managed in conventional methods, but this does not mean that hybrids cannot be administered, or their operations planned (Millar, 2014). Institutional logics are often very deeply embedded into organisations DNA and mixing and melding them can lead to unexpected outcomes (Millar, 2018). Agency of any individual actor is limited, but institutions are also not static, and rather constantly shaped and influence by different actors (Sorsa & Johansson, 2014). The notion of institutional work has been put forward by neo-institutionalist scholars to describe dynamics of institutional change and to bring individuals back to theorising with institutions (Lawrence,

Leca, & ZIlber, 2013). Institutional work is defined as 'the purposive action of individuals and organizations aimed at creating, maintaining and disrupting institutions' (Lawrence & Suddaby, 2006, p. 215). It is an emergent concept in institutionalist stream of research and has been widely applied in different context to examine micro-foundations of institutional logics, interlinkages of institutions and agency, and directs attention to institutional actors as reflexive, goal-oriented and capable by focusing their actions as the centre of institutional dynamics (Lawrence, Leca, & Zilber, 2013). Sorsa and Johansson (2014), for example, used this approach to study accountability in public-private partnership hybrids.

Agency in institutional work, although placing actors at the centre of examinations, does not mean ´mindless institutional reproduction or unconstrained individual agency´, and instead replaces these with collective and distributed, partially restrained agency (Smets, & Jarzabkowski, 2013, p. 1280). According to Smets and Jarzabkowski (2013), notion of institutional work connects macro-worlds of institutions to situated micro-worlds populated by the actors. According to the authors, the notion of institutional work explores individuals as ´carriers of institutions´ (Smets & Jarzabkowski, 2013, p. 1282). For example, medical doctors work as carriers of their profession as an institution. Researchers work as carriers of the institution of academic research. Employees carry the institutional logics of their organisation. The same actors can be involved with many institutional orders simultaneously.

Lawrence, Leca and Zilber (2013) noted that one of the issues in current state of the research on institutional work is that studies tend to emphasise intent and ignore messiness of day-to-day actions. Furthermore, Millars (2019) work on disaggregated hybridity suggests that these prescriptive measures used by the actors may have limited influence, and influence may vary in different levels of hybridity. Smets and Jarzabkowski (2013, p. 1282) suggest practice-theoretical orientation to institutional work, where ´construction and maintenance of social order is always agentic and potentially surprising´. Even mundane institutional work that does not entail intent or agency towards institutional change is part of the process of maintaining, disrupting or creating institutional order. Smets and Jarabkowskis (2013) approach to institutional work is particularly interesting, because the authors studied how individuals construct and reconstruct complex institutional environments in their daily practices and theorised on how cross-sectoral collaboration evolves into a codified hybrid practice through this work. The fundamental problem in the

institutional work approach is related to complex considerations on where individual ends and institution starts, and to what degree individuals reflect institutional logics.

3.4. Implications of multiple logics on hybrid governance

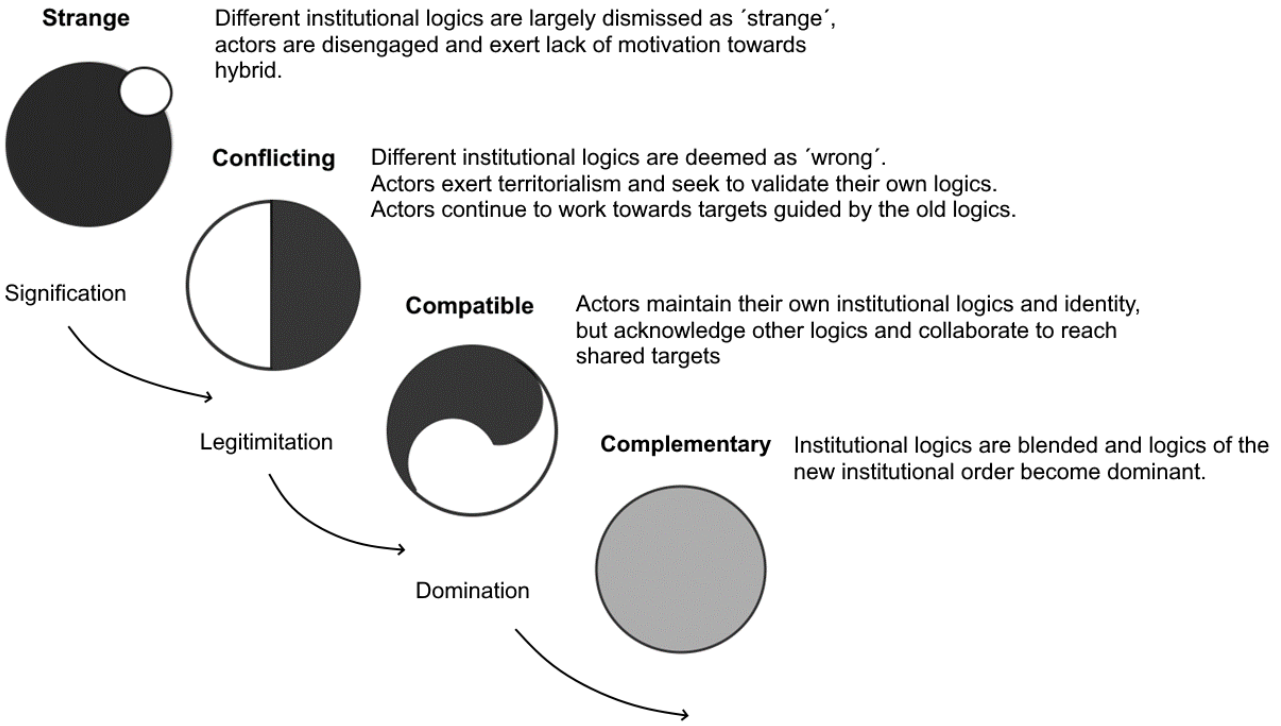
The last chapter reviewed institutional logics approach and its relevance in study of multi-organisational cross-boundary arrangements, as well as the role of agency in shaping institutional orders. As already noted, appropriate activities and relationships of different actors are profoundly defined by institutional rules and norms (Barley & Tolbert, 1997). Institutions are enacted and organizational boundaries drawn through routinised patterns and scripts deeply embedded into material, symbolic, and routinised organisational practices (Barley & Tolbert, 1997). These patterns guide organising principles in cross-boundary settings and have many implications to hybrid governance: Multiplicity of value creation logics is both a curse and a blessing for hybrid organisations (Johanson and Vakkuri, 2017). It has potential to deeply disturb operations (Skeltcher & Smith, 2014) and on the other hand it may aid hybrids in working in external institutionally complex environments and creating value to multiple stakeholders with different interests (Ebrahim, Battilana and Mair, 2014). Although different autonomous units and individual actors have limited power over institutional logics and as Millars (2019) stated, and prescriptive governance measures may have limited impact on interplay between different logics, institutional logics in action have been recorded to have fundamental impacts on organisational outcomes, and agency does play a role in institutional stability and change. Thus, dynamics of institutional logics should be subject of interest for studies focusing on hybrid governance, orchestration or management.

Hybrids are often weak in the beginning. As new organizations they typically lack normative power and may stumble on their institutional complexity. Their autonomous organizational units may be able to impose their own logics over those of other stakeholders, and hybrids thus are more “vulnerable to challenge and less apt to influence action” (Barley & Tolbert, 1997, p. 96). The result may be ´mission drift´ as described by Ebrahim, Battiliana and Mair (2014), where one logic overwrites another. For example, enterprise which primary purpose was social value-creation starts to focus more on the commercial side of their operations in the expense of their original mission. Fail to govern and address different institutional logics

has been described to negatively impact organisational outcomes also elsewhere in hybrid literature. Skelcher and Smith (2015) investigated dynamics of institutional logics in social enterprises. The authors described blocked and segregated hybrids, referring to a situation where inherent tensions between incompatible logics cannot be resolved or managed, which eventually leads into organizational dysfunction. Reay and Hinings (2009) have conducted a case study on rivalry between logics of medical business and medical professionalism. Medical professionals were excluded from management boards of regional health authorities, but continued practice based on their own logics and as a result incurred unplanned costs for the whole system. When logics were in competing position, health sector hybrids were unable to perform.

One of the challenges is that institutional logics are constantly evolving. Dynamics of institutional change or stability have been widely explored in hybrid literature and have important implications for hybrid governance. Cycles of institutional evolution from collaboration to codified hybrid practice has been proposed by Smets and Jarzabkowski (2013). The authors documented different stages of institutional change in international law firm, describing the stages of evolution of relationship between different institutional logics as ´strange´, ´conflicting´, ´compatible´ and eventually to ´complementary´ new, codified hybrid practice. Although their typology of institutional evolution suggests formation of uniform new hybrid institutional logic as an ultimatum, the authors note that the stages can vary. Pache and Santos (2013), for example, have described persistence of different field-level contradicting logics over the period of 30 years. Problematic stages are what Smets and Jarzabkowski (2013) described as ´strange´ and ´conflicting´. Although authors noted that continuous interaction between different institutional orders and practices, as well as everyday pressures to ´get things done´, often tend to result in mixing or blending the logics in a new way, sometimes different contradicting logics can co-exist quite harmoniously for prolonged periods of time. This was documented in the health care sector study by Reay and Hinings (2009). Over time, different conflicting logics in medical sector found more harmonious ways to co-exist and even collaborate to achieve joined goals.

Figure 3. Cycle of evolution: Institutional logics in hybrid settings, adopted from Smets and Jarzabkowski (2013)



Pache and Santos (2013) have described *de-coupling, compromising, combining* and *selective coupling* as responses to conflicting logics. According to the authors, in *decoupling*, organisations separate their normative and prescriptive structures from their operations and maintain gap between symbolically adopted policies and operational actions. This approach is adapted especially in the situations where policy is prescribed by external institutional actors, and in practice organisations continue to work as usual according to their old logics. As Pache and Santos (2013) and Smets and Jarzabkowski (2013), situations where old practices are carried out as usual and new logics only symbolically adopted are often challenged over time, because continues interaction tends to diffuse new practices and values. In *compromising,* organisations balance between different logics and try to legitimate operations according to several logics simultaneously, but often simply reaching minimum requirements in order to demonstrate legitimacy to multiple accountabilities (Pache and Santos, 2013). The result may be little uncomfortable to parties involved but satisfy the needs of vastly different stakeholder groups with potentially conflicting interests. In some cases, logics can be *combined*, and quite effortlessly support each other. This is the case

for example in micro-finance used as a classical example, and often perceived to be ideal type of approach towards plural logics (Ebrahim, Battilana & Mair, 2014). Fundamental challenge in hybrid organisation is how coordination can be achieved with low cost and without losing the advantage if decentralised decisions (Ménard, 2004). Compromising and blending logics takes time and effort and increases administrative burden. In multiple case study conducted by Pache and Santos (2013), *selective coupling* was recorded to be far more common approach than de-coupling or compromising. Selective coupling, according Pache and Santos (2013, p. 994), refers to ´the purposeful enactment of selected practices among a pool of competing alternatives´. According to the authors, instead of ´blindly complying institutional prescriptions´, hybrids intentionally shop between alternatives proposed by different institutional logics and use different logics to meet different organisational goals and objectives and avoid extensive interaction and work that goes in compromising and combining logics. As evident, the strategy can sometimes create inconsistencies.

Hybrids differ in the level of centralisation of control (Ménard, 2004). According to Ménard (2004, p. 20), empirical studies suggest that the degree of centralization depends on “the degree of mutual dependence and the complexity and turbulence of the environment in which a hybrid operates”. Research suggest that design of the governance models is often contingent and evolutionary. There are myriad types of hybrid organisations, and as a result, various different ways to govern and structure hybrid operations. Autonomous organisations within hybrid can be loosely linked together through history, influence and social ties in the other end, or on the other hand have their own *ad hoc* governing institutions that operates as quasi-independent entity (Ménard, 2004). Ebrahim, Battilana, and Mair (2014) talk about governance boards. Relationship of control mechanisms and institutional properties have not been extensively studied, but as Pache and Santos (2012) stated, institutional logics likely fundamentally impact how control mechanism and goals in hybrid organisations are formulated, e.g. to what extend organisation adopt for-profit principles.

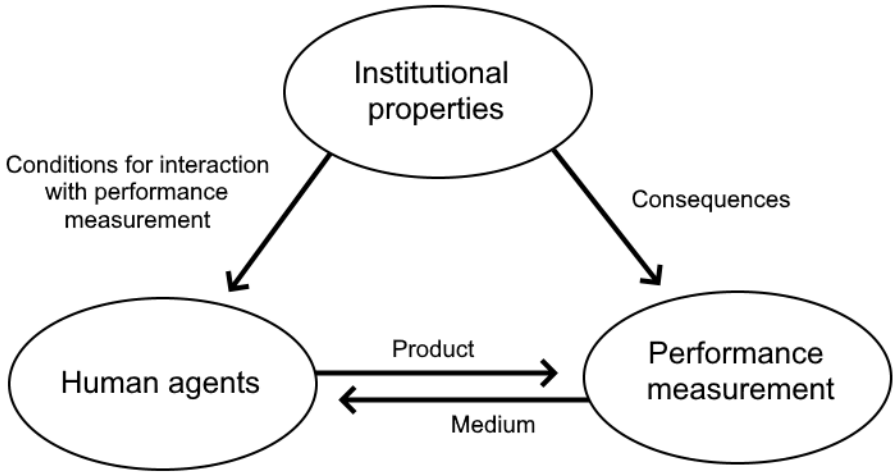
3.5. Performance systems, institutional logics and agency

Performance measurement is a widely adopted practice in modern organisations. Quantification of performance is a practice that is intended to reduce human uncertainty and clarify accountabilities within the system (Johansson & Vakkuri, 2017). It is interesting theme for further examination, because performance systems capture what is perceived by and organisation as valuable and desirable, and thus exemplify institutional logics. Performance management in hybrids settings operates across public, private and third-sector interfaces, relying on inter-sectoral collaboration (Rajala, Laihonen, & Vakkuri, 2019). Performance measurement is intended to be used as a tool for organizational control in producing objective and relevant information for justifiable and informed decision-making that aims to improve the overall performance of the organisation (Johansson & Vakkuri, 2017). In hybrid settings traditional models may prove to be inadequate. Public, private and third sector organisations may have conflicting views on what is valuable to the organisation and its actions, and performance measurements conventionally used in these sectors differ (Rajala, Laihonen, & Vakkuri, 2019). According to Johansson and Vakkuri (2017), the problem is that there are no uniform practices that would guide organisations in planning their performance management systems.

Most of the performance management literature focuses on prescriptive managerialist measures and strategic planning and pays little attention to performativity of the metrics or human agency that shapes the control systems. Performance systems in hybrid organisations should be understood as social constructs. Figure 4. adapted from Johansson and Vakkuri (2017) represent interconnectedness of institutional logic, performance management system and individual actors. Institutional logics restrict and lay out frames for the human agency in interaction with performance measurement. Institutional logic also shapes the measurement systems. As already noted, different institutional orders tend to have different measurement systems. In private organisations, these are usually based on the conventions of financial and management accounting, and evaluations are focused on key performance indicators (KPIs). In public sector, evaluations differ, and neutrality and transparency are important values (Johansson & Vakkuri, 2017). Performance

measurement, according to this institutionalist framework, is understood as a medium of human action but at the same time as a social construct. This means that although it mediates agency in hybrid systems, it is also influenced by institutional logics, institutional work and organisational every-day practices. Issue of performativity arises: Measurement not only explains reality, but by measurement reality and institutional order is shaped, formatted and enacted (Johansson & Vakkuri, 2017). Performance system constructs institutional order in hybrid arrangements and creates stability over the network of actors. They reflect governance approaches towards multiplicity of institutional logics. For example, Pache and Santos (2013) used organisational goals and control systems in mapping different institutional logics and their practical implications to organisational outcomes.

Figure 4. Interconnectedness of institutional properties, performance management and human agents, adapted from Johansson and Vakkuri (2017)



In hybrid systems, goals and performance are impacted by multiple different logics. This creates many challenges to hybrid type of organisations, as performance systems and joint goals need to capture institutional logics of multiple hybrid stakeholders, often with parallel or conflicting interests. In bioeconomy context this may mean that evaluation is interested not only on how public money is spent or how much profit the network of actors can generate, but combination of measurement elements from different hybrid orders, including contributions to scientific research and reduction of carbon emissions or implications to

natural ecosystems or biodiversity. Hybrid partners need to be able to legitimise their performances to variety of different audiences and stakeholders (Johansson & Vakkuri, 2017). In bioeconomy development, participants may present local communities, public governance, industry associations, individual businesses, environmental NGOs, research organisations or education institutes. As a result, hybrids may suffer from excessive accounting systems or what Johansson and Vakkuri (2017) describe as ´multiple accountabilities disorder´: The organisation aims to be accountable in every possible sense. The underlying problem is how these heterogenous bodies can manage differences in their institutional logic and variance in their institutional properties in a way that allows them to create shared goals and performance targets, and how they can evaluate resulting systems as a whole in a way that satisfies all the stakeholders. At the same time, according to Johansson and Vakkuri (2017) hybrid performance systems may suffer significant gaps. There may be areas that are difficult to measure, or measurement is not supported by any of the existing institutional orders.

Another challenge for hybrid performance management is that there are no uniform best practices that would guide organisations and individuals in formulation of hybrid performance systems. Instead, hybrid settings have segregated data on divergent metrics of individual entities and organisations with large cultural variance (Johansson & Vakkuri, 2017). They are highly ambiguous, and currently leave many questions both for scholars and practitioners.

Tampere University

4. EMPIRICAL CONTEXT: HYBRIDITY IN BIO-SECTOR

4.1. Bioeconomy transition in Europe

Transition to the use of renewable energy and renewable materials are recognised as central elements in combatting climate change. The concepts of bioeconomy and sustainable development are closely linked together, but both are fluid and ambiguous conceptualisations of systems with no clear boundaries. Bioeconomy is a multidimensional concept developed by the practitioners rather than researchers (Lewandowski, 2017). Generally accepted and simplified definition of bioeconomy is a type of an economic system where production is based on renewable biological materials. There are multiple different and partially overlapping more detailed definitions. Among the most well established and widely distributed ones the definition by the European Commission. The Commission defines bioeconomy as "the production of renewable biological resources and the conversion of these resources and waste streams into value added products, such as food, feed, bio-based products and bioenergy. Its sectors and industries have strong innovation potential due to their use of a wide range of sciences, enabling and industrial technologies, along with local and tacit knowledge." (European Commission, 2019). Bio-sector is thus composed of several different industry sectors, including forestry, energy production, agriculture and food technology, chemical sector and pharmaceutical sectors, with multiple different stakeholders and overlapping accountability relationships. Interviewed experts portrayed the diversity, multidisciplinary and multi-actor nature, and fragmentation of the bio-sector as a whole in their answers, describing different fields of industry, different actors, and interlinkages with circular economy and sustainable development.

> "Circular economy is *the* big thing, and bioeconomy is under circular economy."

> " --- There is a lot of talk about this bioeconomy related to forests, in Nordic countries, in Finland, in Sweden it is also very strong. And it is a separate discussion altogether, how bioeconomy can be advanced through utilisation of different biomasses in forestry. But on the other hand, we have for example things like replacing plastics with

bio-based materials, so that is also one of the big sectors. And there is food sector and agriculture. I think these are kind of big things, central things here [in bioeconomy]."

"All operations and activities that aim at using renewable resources instead of fossil-based resources. --- Many people can perceive it to be linked with forests and forest use, but it covers wide set of activities, one could say from traveling to food, everything that is linked with smart use of environmental resources."

"Bioeconomy in general will be in future increasingly reflected across different sectors. We will begin to get new bio-based products that help us replace other products. Naturally, circular economy should be taken into account and combined with bio-based innovation. It isn´t the aim that all this biomaterial knocked over, we need to pay attention to sustainable development."

Despite topicality and importance, there is a lack of clear understanding of what bioeconomy means and what it entails. Kokkonen (2010) summarises, based on expert workshop results, that broad-based and open definition of bioeconomy is needed, and states that the definition should contain both tangible and intangible natural resources. The topic of boundaries of bioeconomy were briefly discussed in expert interviews. The experts I interviewed were very cautious to draw any clear boundaries or provide definitions on ´bioeconomy´ or ´bio-sector organisation´.

"I would not like to make any statement on what is bioeconomy and what it is not… Regarding my own experiences, and in my case how I will define it so that it is related to the use of natural resources, and how they are used, how we advance circular economy principles, and how we find new value-added products, and new qualities from renewable materials which we can use to get somewhere beyond simply mass produced bulk".

"Bio- and circular economy go pretty much hand in hand and it is quite simply a question of interpretation of these concepts, whether you want to think of bioeconomy as a part of circular economy or circular economy as a part of bioeconomy."

In addition, one expert noted that there is still lack of awareness concerning bioeconomy as a concept. Not all actors involved in bioeconomy development identify themselves as bioeconomy builders. On the other hand, there are fields such as food and agriculture that are and always have been bioeconomy at their core, where the concept of bioeconomy is not as widely discussed.

"We have many organisations in the Baltic Sea region that do not even know that they are representing bioeconomy. The term is so scary that they do not consider themselves as organisations that represent bioeconomy."

4.2. Bioeconomy in public policy and future policy targets

The European Commission set out European Green Deal for the European Union (EU) and its citizens in 2019. Green Deal is a broad-based set of policy initiatives that aim at climate neutrality by 2050. Transition to circular economy is an important part of the package and increasing use of bio-based and renewable materials across industries and sectors a central policy objective. European Commission has recognized the development of circular bioeconomy as a central for fulfilling the targets for carbon neutral future set in the climate objectives of the Paris Agreement. Another goal is to support the economic renewal within the European Union through modernising the industrial base in member states by creating new value chains and increasingly cost-effective industrial processes (European Commission, 2018). The logic in the big picture is in a sense already hybrid, because the goal is to achieve simultaneous economic and sustainable development. As a part of the concept of circular economy, bioeconomy is emerging as a type of policy-making instrument that captures these dual objectives through innovation particularly in high-tech sectors. What is at the same time the strength and weakness of the bioeconomy as a concept is that it allows private organisations to capitalise on bio innovations according to classical neo-liberal economic principles readily fitting current economic model. The concept has gained criticism on these premises. As a result, it is increasingly being directed under the umbrella of circular economy, and sustainability is placed as a key issue in development of new products and operating models.

Within European Union, there are vast differences in current state of bioeconomy development. Finland is an interesting context to study as one of the frontrunners of circular economy transition, and the country has established ambitious national strategy towards bio-based circular economy. In Finnish context, forestry remains as the biggest bio-based sector and as the driver of the industry. Many of the sectors included in bioeconomy of Finland, especially forestry and forest-based biomasses, are extremely critical for national and regional economic interests – According to Business Finland, Bio- and cleantech are already Finland's biggest export sector. A belief that the bio-sector has distinct importance for Finnish national economy and society as a whole was evident in the responses of interviewed experts. Experts also expressed a belief that bioeconomy transition is advanced in Finland:

> “In Nordic countries bio-sector is particularly strong”

> “--- That in it is very wide, the pursuit [towards bioeconomy] in Finland. Because we have these natural resources say forests and all, and in general natural resources are in a major role, so in a way this [natural resources in Finland] in kind of a driver that increases the importance of bio-transition.”

According to many of the interviewed experts, bioeconomy in Finland is advanced due to vast amount of natural resources. Resource use, when dealing with so called common pool resources is highly politicised question and involves multiple stakeholders. Use of natural resources has evoked many debates. For example, Valkeapää and Karppinen (2013) portrayed multi-stakeholder and complex nature of forest policy. Bioeconomy development is thus highly politicised, cross-sectoral, and lots of the work takes place in public-private interface. It is highly reactive to macro-environmental changes and politics.

> “Maybe corona pandemic has brought locally produced food back to the surface. How we need to be self-sufficient. And then what is Finland’s big thing in which we are good at internationally.”

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4.3. The role of hybrid organisations in bioeconomy transition

Development of platforms and industry clusters has been described as central elements in both European Union wide bioeconomy and sustainable development strategies and Finnish national bioeconomy strategy. Inclusive development is perceived to create value for both organisations involved and surrounding society:

> ”It has been observed that in this type of open ecosystem development where businesses can enter their own pieces of contribution we can create a system that is beneficial from many different perspectives. It benefits the firms, because they get opportunities to generate new business, but it also benefits municipal community and infrastructure, and ultimately the consumers.”

Bio-innovations are resource intensive and require extensive knowledge and highly specialised technologies. Pooling resources especially at early stages is perceived to enable new innovations. Hybrids were also perceived to have important role in development of circular bioeconomy, because innovating on what to do with side- or waste-streams often requires multidisciplinary and cross-sectoral approach. Materials are often used in completely different sectors, for example fractions extracted from food waste can be used in generation of bioenergy or refined for high-value products such as novel foods, pharmaceuticals or cosmetic ingredients. Progress often requires research as well as know-how and skills that need to be sourced externally.

> “So that we can increase value-added products and we would get these new products. And it does not have to be huge, but that it would bring prosperity.”

> “And then maybe side-streams that are currently not ending up into products that can be sold but could… That they would not end up into landfills or compost but that we could extract new valuable fractions from them, which maybe could be used for example in cosmetic industry or wherever, so perhaps there we would also have more potential. But that requires cross-sectoral collaboration so that the demand, users and supply meet each other.”

Opinions varied from smarter and more effective use of existing resources to new products and innovations that benefit the environment, the national economy and the consumers. Most of the expert expressed the idea that collaboration between different stakeholders is central for achieving policy goals and in supporting large-scale transition towards bioeconomy.

4.4. Types of bioeconomy-related hybrids

Experts were asked about whether hybridity is something that is typical for bio-field and what is the current state of cross-sectoral collaboration in Finland. Interviewed bioeconomy experts considered hybridity to be increasingly relevant in field-level. Experts mostly agreed that hybridity is typical phenomena in bio-sector, but opinions on how commonplace hybrid organisations are in the field varied between interviewed experts. One interviewed expert stated that nearly all organisations in bio-sector can be perceived as hybrids, referring to bio-sector as a research- and technology intensive field. Another expert stated that there are not that many hybrid organisations in bio-sector yet, and most of them are still relaying heavily on public support. These different perceptions on prevalence of hybrid organisation in Finnish bio-sector may be attributed to different conceptualisations and understandings of what hybrid organisation is. Several scholars have attempted to classify hybrids based on their distinct characteristics. Recurrent approach is to classify hybrids into organic hybrids that have gradually evolved from traditional organisations through introgressive hybridisation, and enacted hybrids or hybrids by design, which are hybrid organisations by intention and ideally represent a truly novel organisations form (Doherty, Haugh & Lyon, 2014; Johansson and Vakkuri, 2017; McMullen, 2018).

> ” And it [development of a hybrid arrangement] has been since the beginning this type of strategically and consciously led activity, which I think is a big part of why we have succeeded.”

The latter approach may be attributed to novel arrangements like bio-hubs and industrial symbiosis -related projects that are still under development, while introgressive hybridisation can be perceived to have taken place around the Finnish forest industry giants for already quite some time. Large biorefineries are typically a product of extensive research and joint development, and structure complex organisational ecosystems around raw materials they are processing, although formally they may not form single new organisational entity.

> “If we think about large biorefineries, quite many of these forest industry corporation, UPM, Stora Enso, Metsä Group, ST1, are composed of different sectors, so they are in a way hybrids, and there [in biorefinery project] there is this big corporation as a type of an engine at the core but then lots of small companies are formed around it, and research will be involved, and all other kinds of activities. So nearly all the big ones are in some way connected to hybrid activities.”

> "At this point one might still think that most of them [hybrids] are developed around different raw material chains, where a company can have access to that raw material flow without having to invest heavily in the supply of that raw material itself. But it is being built all the time, and unity is gradually forming. Of course, we are still on early stages of development."

Although using hybrid concept in describing organisations structural sense is not the primary focus, another point of interest was what types of hybrid organisations can be found from bio-sector, and how they can be classified or typified beyond just whether they have been formed by design and intent or grown organically from already existing organisations. Research has placed hybridity in number of different empirical contexts. The question often is how to create social value through privatisation of public services. In bio-sector and in bioeconomy context, the question is how to create environmental value by capitalising on innovation. This results into versatile arrangements that combine institutional logics of research, private businesses, regional development, and environmentalism, that are difficult to classify. Based on arrangements that were brought up in expert interviews and their reflection against theoretical background, I have identified three different types of bio-sector hybrid organisations. These three models differ in their orientation and focus, structure, and often dominant logic.

Triple-helix innovation and development projects

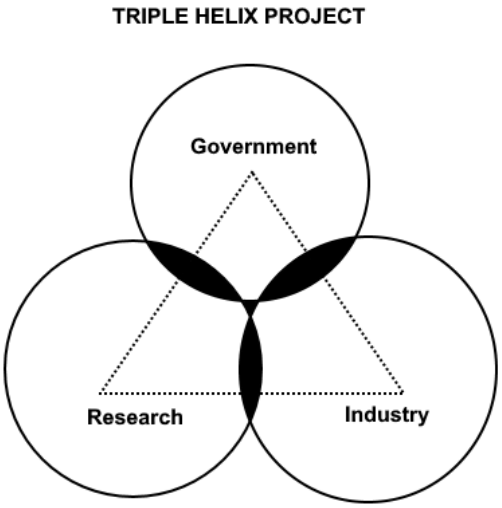
Public-private partnerships are organisational type frequently investigated in hybrid research (Johansson & Vakkuri, 2017), and some of the recent notions have investigated projectivisation and hybridity (Johansson & Vakkuri, 2020, forthcoming). One of the types are public-private partnership projects for innovation. In expert discussions, triple-helix model of innovation was recurrent in hybrid project settings. This model has been applied in the field to different projects, where the helix is formed with academia or research (often research institute or university), government (often regional body) and industry (often small- and medium sized enterprises and regional innovation and development companies). It is particularly common in Public-Private Partnerships for innovation, and triple-helix hybrids were most typically described to be project organisations. They combine public financing and partners own funding, blend different institutional logics from various sectors, and are often formed to solve specific social and environmental challenges. These arrangements often focus on developing systems, new business models and regulations. They are in legal

sense loosely knit through contractual arrangements, or they may be project organisations arranged under shared funding.

> "We work according to this Triple-Helix model. We have our research institution, then we have regional development and governance, and then we have development corporation and local businesses that represent the industry."

> "It is quite typical in projects that you have research, then you have public administration, and then you have industry representatives that form consortia-structure."

Figure 5. Triple Helix Innovation Project



Industrial symbiosis and hybrid organisations formed around material flows

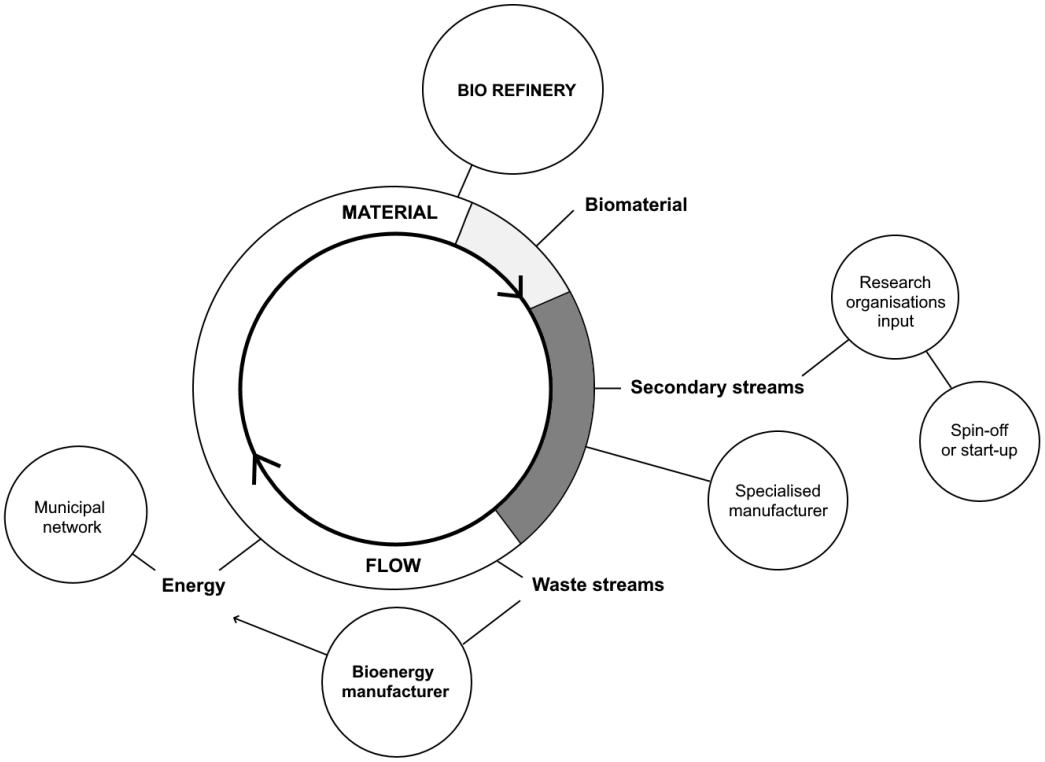
Another type that was already discussed in this thesis are hybrids that are formed around bio-based value chains. These communities of practice are organised around material flows, often organically. These types of hybrid organisations aim at capitalising on specific bioeconomy related opportunities, rather than combatting challenges. They were described as complex structures where number of different actors, most typically private organisations, take different roles around same material flow and often aim at utilising it according to circular economy principles. Often research and public logics are involved in development stages, and there may be private-public ventures in later stages of value chain, for example end-products may be used locally by the municipality. In these arrangements, availability of biomaterials, their logistics and optimisation of resource utilisation are central focus points.

Although they combine scientific research and business principles and often diverse sources of funding, these types of ecosystems are focusing more on private logics. In organisational sense, they are often tied together often with bilateral agreements and partnership contracts. Major industrial body works as a keystone actor that holds the system together. An example given by one of the interviewed experts of this type of an arrangement is Raisio bioenergy plant built in 2017 by Raisio Group, which is a large publicly listed Finnish food industry operator. CH Bioforce, a company specialised in biomass refining, can isolate valuable molecyles from the biomass, from which Montinutra, company that manufactures biopharmaceuticals and nutraceuticals from forest-based fractions, is able to manufacture food supplement products. Renotech, a company specialised in industrial processes and construction materials, can optimise the energy production process so that ashes from burning the biomass can be used land filling.

> "One can say that hybridity the way we see it is based on process thinking, we had this whole value chain as our goal, and it has been built and developed"

> "Our operations are primarily industrial. Aim in our operations is industrial symbiosis."

Figure 6. Industrial symbiosis – Hybrids organised around material flows



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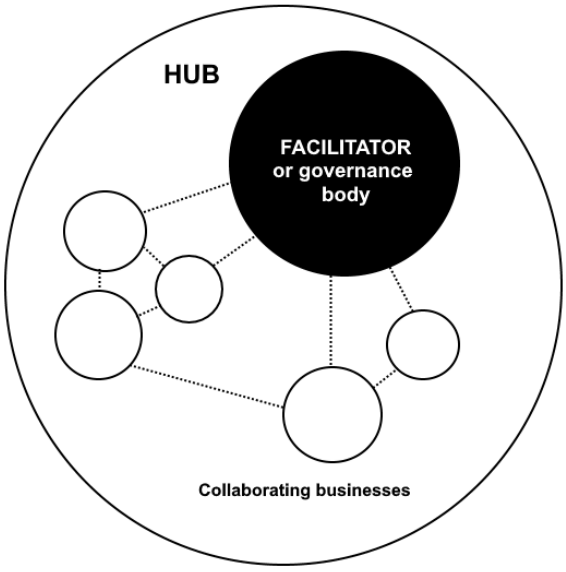
Bio-hubs and bio-innovation platforms

Third type of hybrid arrangements focus on innovation work and new product development, such as public-private-partnerships (PPPs), innovation platforms and projects, or strategic clusters organised around keystone operator or hub-firm. Hub firms are often organised around keystone operator. Järvi, Almpanopoulou, and Ritala (2018) note that knowledge ecosystems are typically organized around a focal firm, technology, platform or value proposition, or higher education or research institute. Hearnshaw and Wilson (2013) refer to hub firms, the organisations that tie the whole network together and coordinate the chain. These keystone organisations may be in a sense singular hybrid in terms of their legal structure, or type of hybrid organisations with quasi-or fully independent formal governance board (e.g. CLIC Innovation, Smart Chemistry Park, BioPaavo Business Accelerator). They may have more formal structure compared to project organisations and hybrids that form around industrial symbiosis. The role of a keystone operator is often to facilitate and provide services (for example work or laboratory spaces, events and networking tools, aid in obtaining financing) for partner organisations. There may be physical spaces or areas designated for hybrid work, where different actors representing research, education, regional governance, local businesses and financiers can meet and collaborate.

"We will continue to work as an independent body and our primary function is to facilitate and enable innovation"

Figure 7. Innovation platform or hub-firm type of hybrid



4.5. Drivers of hybridisation in bio-sector

Reason why organisations cross their boundaries were discussed in the theoretical framework of this thesis. Bioeconomy is often perceived to possess certain idiosyncratic characteristics that encourage hybrid activities as a technology- and knowledge intensive and innovation-driven field. In order to understand what happens in system level and how relevant hybridity is in bio-sector, I mapped drivers of hybridisation based on empirical data. Drivers are summarised in Figure 8.

According to the European Commission (2019), “Conventional approaches will not be sufficient. Emphasising experimentation, and working across sectors and disciplines, the EU’s research and innovation agenda will take the systemic approach needed to achieve the aims of the Green Deal”. Certain macro-level of political pressures towards hybridisation can be observed from Union level to national level policies. The Finnish Ministry of Employment and Economy has established the development of bioeconomy cooperation platforms across traditional sectoral boundaries as one of the main strategic goals of the Finnish Bioeconomy Strategy: “Bioeconomy cooperation platforms (SHOK Centres, INKA programme actors, research cooperation models) must be geared to cross-sectoral activities that create innovative solutions and improve competitiveness to give momentum to business that is successful in the international market. Cities and subregions must be harnessed to this cooperation, and strong links must be forged with international networks” (Finnish Bioeconomy Strategy, The Finnish Ministry of Employment and Economy, 2017). Similar propositions have been presented in reports by the Finnish Innovation Fund Sitra. In findings composed by Kokkonen (2010), silos and fragmentation of bio-sector was considered to be a significant challenge restraining bioeconomy development, and importance of networks and joint regional development was underlined. Experts interviewed for this study reflected on these same issues when discussing overall challenges in the field:

> “In project world we constantly run into this problem that even similar types of projects are not aware of each other we do overlapping things, instead of searching for ways to work together. Reasons behind this are natural: Operators do not have time and resources for that, so it would be investors role to provide resources and demand more of this [collaboration between projects]. It would be important to have at least national-level collaboration, but also international cooperation”

> "I feel, I have this impression, that it is quite disintegrated and fragmented still at the moment. One could say that there is solid know-how and skill concentrated in certain areas, and the focus often is in some certain field in bioeconomy".

Another macro-level driving force behind hybridisation in bio-sector according to the experts was that many of the related issues are highly politicised multi-stakeholder wicked problems. Public intervention was perceived as natural. Organisations collaborate with each other to gain legitimacy and public acceptance, as proposed in the theoretical framework. Another perspective was that as business sectors bio- and cleantech are still in their infancy, and in addition to working with common pool resources, relay heavily on public support. Organisations collaborate to gain control over external resources. Macro-scale policy and public funding was noted by many experts to steer organisations towards increasingly intensive collaboration:

> "That [hybridity] is probably typical for other research-intensive sectors, but of course when we consider this zeitgeist, or picture of the time, and bioeconomy in broader sense because it is discussed more widely in the society, and it is in this kind of political agenda..."

Interests towards more intensive collaboration is not solely result of EU policy. Ecosystem and network-thinking is frequently brought forward, often anchored to hybrid ideal, by organisations and individuals: The ideal form of hybrid organisation creates value beyond what any single organisation could create alone (Battilana, Walker, & Dorsey, 2012). The idea embedded to all hybrid arrangement is that by bundling their expertise organisations can do well by doing good (Johansson & Vakkuri, 2017). The resulting arrangement creates a win-win-win situation. In circular economy context, the notion of industrial symbiosis has been widely adopted, in which wastes, residual materials, or by-products of an industry process become raw materials for another process through joint innovation. Experts also reflected increasing hybridisation to open-system views on organisations such as resource-dependence and relational rents as a source of competitive advantage. These have been previously identified as important drivers for cross-boundary collaboration by Kunttu (2017).

> "—and we can utilise every participant strength… ---- In my opinion it allows us to better utilise research results… I mean the know-how simply is in completely different level."

> "Everyone's in and together we are trying to pursue greater benefits for all."

Hybridisation in field level was attributed to macro-scale changes in institutional structures, work culture, and paradigm changes in the field of management. Open information and knowledge sharing are perceived increasingly as ´the new normal´ and mutually beneficial for all parties. As Kunttu (2017) noted, organisational learning and new knowledge generation are important motivators towards more intensive collaboration across organisational boundaries.

> "Somehow, I would justify it so that in bioeconomy and in the future in more general, open information-sharing and collaboration are crucial, and one can no longer succeed by toiling alone and seeing everyone else as a competitor. Multi-organisational innovation and co-development are almost mandatory nowadays."

> "Lots of organisational learning takes place, both ways."

> "We know that cross-sectoral knowledge sharing is enriching, and a way to develop."

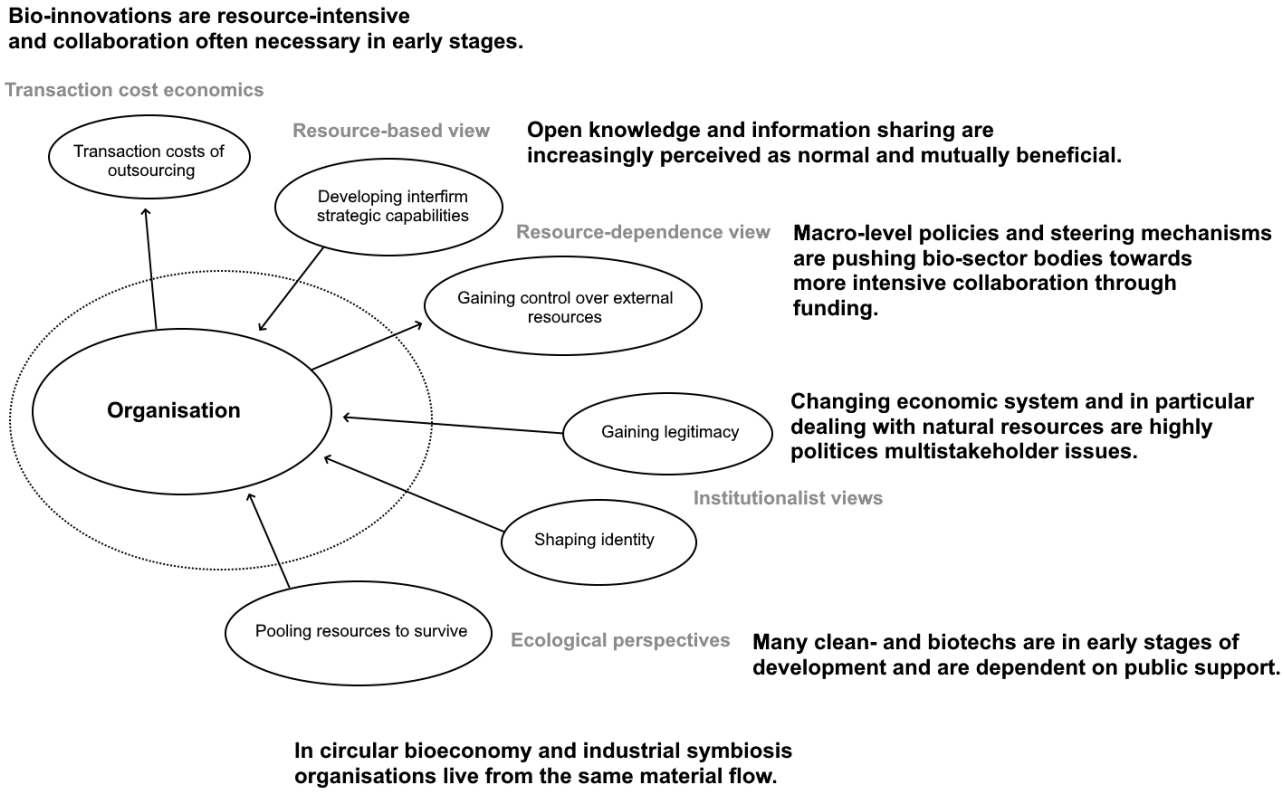
In particular, one of the aims is to increase value added to bioproducts and creation highly developed products instead of supplying bulk or raw materials. Innovation-centricity was noted to create pressures for hybrid operating models. Bio-innovations are resource intensive and require extensive knowledge and skills that are costly to acquire. Transaction-cost considerations drive organisations towards closer collaboration and resource pooling. Grounding innovations into practice takes time and effort. Cross-sectoral and cross-boundary collaboration was recognised by many of the interviewed experts as enabler of faster and more agile innovation distribution and commercialisation.

> "When we talk about bioeconomy, there is certainly potential, and of course forest industry is in big role and has always been there, but we need to increase value-added products."

> "—and hopefully we can be more agile and work faster and bring these new solutions into trial and practice much faster than before."

> "In hybrid organisations we have better perquisitions for agile reactions under the terms of different financing instruments. Considering for example case of Covid-19 Business Finland, fast ideas and applications and joint effort among businesses and research institutions. We only had few weeks' time to react, and short project time frames to set up experiments, which we succeeded, with big resources."

Figure 8. Drivers towards hybridisation in bio-sector



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5. INSTITUTIONAL LOGICS IN BIOECONOMY

5.1. Field-level institutional logics in bio-sector

Hybrid organisations are composed of multiple different institutional logics (Johansson & Vakkuri, 2017; Pache & Santos, 2013). These logics influence organising principles in several levels. One of the objectives of this study was to map macro-level institutional logics that guide organising principles in bioeconomy. Following chapter describes field-level institutional logics, their contradictions and their interconnectedness based on empirical data and comparative analysis with theory. The analysis revealed that in bioeconomy contexts different institutional logics are often deeply interlinked, and although clashes cannot always be avoided, experts noted that these logics co-exist typically harmoniously in bioeconomy. Interviewed experts described values, practices, and principles that were, based on comparison and grounded theory approach, categorised into following institutional logics: Capitalist market logic, logic of environmental protection, logic of regional development and public administration, and logic of scientific research. These logics are described in the next chapters.

Institutional logic of capitalist market (commercial for-profit logic)

Capitalist market logic is present in original typology by Friedland and Alford (1991), and since then been referred in many hybrid studies including Pache and Santos (2013), Skelcher and Smith (2015), and Johansson and Vakkuri (2017). One of the most pervasive logics in bioeconomy is corporate for-profit institutional logic. Profit maximisation and new business creation are fundamental parts of bioeconomy as a neoliberal concept that is readily adaptable into the current economic system. Corporations are accountable primarily for their shareholders, and work according to free market principles. Innovations, competitiveness and agile development are emphasised. Large share of bioeconomy development takes place in private enterprises, or in very close collaboration with private enterprises, and also in policy-level economic interests are strongly present as earlier

discussed. Although not explicitly stated, experts across the sectors recognised this logic as central and contribution of businesses as vital for the development of circular bioeconomy.

> "I see bioeconomy as future, something that has potential to raise competitiveness of Finnish national economy into a completely new level."

> "In my opinion all the tools are right in front of us, we have solid know-how, we understand the processes and how to build efficient and economic plants and all that. When the big companies get the will and start to drive it [the development of bioeconomy], it will move much faster."

> "We need to consider the bottom-line of any project."

In market logic, profit is valued and bottom-line often dictates courses of action. However, capitalist market logic is increasingly being entangled and blended with institutional logics around environmental protection and scientific research. For example, Dahlmann and Grosvold (2017) noted that environmental logic and market logic share certain conformity, although their motivations may be different: Both are interested in, for example, energy saving measures, and social legitimacy of corporate actions. While these two logics have been formerly perceived as contradictory, they are increasingly recognised as complementary. Johansson and Vakkuri (2020, forthcoming) state that environmental ´problems´ are transformed into ´opportunities´ for investments and profit-making, and capitalist logic is harnessed to support environmental actions. Organisations can ´do well by doing good´ (Johansson and Vakkuri, 2017). This is captured in the new concepts such as shared value by Porter and Kramer (2019), but was also widely reflected in expert answers:

> "-- That we create those solutions that prevent climate change, and what kind of solutions can be developed for food and energy production and how we can develop business from those. Business and entrepreneurship are important focus areas."

> "Businesses need research, when we aim at creating new innovations and products. Business-logic of profit-maximisation needs logic of scientific research to develop new products."

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Institutional logic of scientific research

Institutional logic of scientific research and conventions of academic institutions are strongly present in technology- and research-intensive sectors such as bio-sector. They are conveyed in various organisations through highly educated specialist that even though working for a for-profit business have been socialised into practices of academia. Significant differences occur in conceptualisations of time, and this was evident in expert discussions. Scientific research is time consuming endeavour, and practices in research adapted to long time horizons of slowly accumulating evidence, while capitalist market logics demands rapid innovation. Because bio-innovation work is research oriented, institutional logic of scientific research strongly impacts work and organising principles in bio-sector hybrids. Institutional logic of scientific research necessitates open information sharing, while corporate for-profit logic favours secrecy and protection of organisations intellectual property. According to Vakkuri (2004, p. 302) academic work displays "reliance on tacit knowledge, dependence on trust, and an exceptional sense of autonomy". The clashes are recorded especially in information sharing practices, as will be described later in this work. Other issues are often related to transparency, academic freedom and independence.

> "We have our own conventions. Our performance is measured through impact factors and how much we are referenced."

> "When we do these projects, the goal is usually not in today's business, and the businesses understand that we are looking further into the future. And the businesses want that scientific research and research institutions are involved, so that they can utilise the latest research information."

Vakkuri (2004) documented contradictions between the assumptions behind academic culture and formal accountability systems. According to Vakkuri (2017), formal boundaries commonly used in financial accounting (typically university of a department is accountable) rarely reflect informal boundaries of complex research networks. Nevertheless, publications drafted according to academic principles and published in legitimised platforms are valued. Scientific research is loyal for its own conventions and traditions:

> ”When research organisations take part in hybrid arrangements we must keep in mind that no matter the form of the reporting, digital or conventional, in any case in research along with other forms of reporting and accounting the aim is to always compose scientifically-appropriate report that is published as a peer-reviewed journal article in academic platform. In other case findings and observations that result from joint undertaking are wasted resource from research perspective.”

Nevertheless, universities and research institutions are part of their environments and as a result of New Public Management (NPM) trend, increasingly facing market pressures. Interaction in hybrids melds together institutional conventions of academic research and business thinking. Market logics are increasingly present in conventionally scientific work, as following statements demonstrate:

> ”We have collaborated with universities and Luke and VTT --- Research and future orientation is present, but then there is also this feasibility-emphasis strongly present. We challenge universities towards new operating culture. It is not academic freedom, but that is not something that we would aim at with our commissions.”

> “Our point of departure is that everything needs to be based on real needs, we cannot do research for research sake.”

> ”In my organisation hybridity is seen through formation of new spin-of enterprises. In my organisation we have incubator for new ideas and counselling services for commercialisation of research ideas, which provide new routes for research and development for businesses at their early stages.”

Institutional logic of environmental protection

At the heart of bioeconomy is an idea of environmental protections and replacement of non-renewable materials with renewable ones. Logic of environmental protection is embedded in macro-level policies and micro-level work in bio-sector organisations. According to Dahlmann and Grosvold (2017, p. 269), environmental logic is concerned with ´protecting the natural environment and decreasing the organisation’s impact on natural resources´.

> “--- So that we would be on a sustainable ground and could take care of our natural resources.”

The authors documented this logic become more common in their sample of 55 UK for profit firms in repeated interviews within a three-year interval, and similar perceptions were held by the experts interviewed for this study. In abstract level environmental logic is present in nearly all activities, but in practice questions are often more complex. In particular in bioeconomy context, debates on sustainable utilisation of natural resources are on-going:

Use of forest biomass in production of bio-based energy and other bio-based product tends to simultaneously decrease carbon sinks and impact natural ecosystems and biodiversity in many ways (Kleinschmit et al., 2014). In the interviews conducted for this study, environmental logics were underlying theme and entangled with other field-level institutional logics. Environmental logic is present especially in the visions of circular bioeconomy:

> "In long-term environmental consciousness and knowledge of what truly is sustainable will increase among consumers, and pressure will increase so much that businesses will be more motivated to develop truly sustainable solutions. This will be influenced by logics of academic research. Through research we gain more information, and that information will affect consumers."

Logic of regional development and public administration

Supporting regional development is written in EU and national level bioeconomy strategies, and major share of bioeconomy project funding is allocated under regional funding schemes (ERDF). Regional development represents the logic of state and public administration. Unlike for-profit businesses that can select their clients, public logics demand transparency, inclusivity and equality in terms of distribution of benefits (Johansson & Vakkuri, 2017). Decision-making is less hierarchical and democratic, although bureaucratic. Where capitalist market logic drives for profit, institutional logic of regional development aims at prosperity of the region and the local society as a whole. There are some common nominators, for example both capitalist market logic and public institutional logic appreciate low costs (parsimony) and efficacy of operations (Johansson & Vakkuri, 2017). Accountability relationships of public bodies are multifaceted, and typically bodies that actively take part in bio-sector hybrids gain their mandates from higher level and are committed to rules, regulations, and practices laid out from above. Logic of public governance, from EU to local level, reflects both ideas of economic development and protection of environment.

> "We should have funding for that [bio-based innovations]. Single small companies will not commit to solving societal problems otherwise. So, we must have this funding, and many times the sums we are speaking of are not that high. The role of regional administration and financier is to sort of bundle things."

> "ELY-centres for example have environmental protection and land-use issues --- Then entrepreneurship and start-up activities are also central."

> "The aim is to get more actors into this region to cooperate with actors that are already here, and of course we are hoping that current actors would expand their operations in this region. That is something that we want to help enable and bring forward."

Although attributed to public actors, logic of regional development is applied for example in operations of education institutes like universities, and not only limited to actors conventionally thought as public sector operators (Vakkuri, 2004). Local businesses may also be interested in overall development of regional economy and community. Thus, it is important to separate actors and field-level logics.

5.2. Key actors and interplay of institutional logics

Institutional logics are phenomena that occurs across organisational boundaries. Organisations are exposed to different field- or system-level institutional logics even when they are not participating actively in hybrid arrangements. Institutional Logic Approach in its traditional form supports the idea that each organisation has one dominant logic that guides its actions. However, most of the experts identified several logics that influenced activities in their own organisations, and former research has documented numerous situations where different logics co-exist and influence organising within a single organisational entity. This reflects hybridisation of the field. In the following chapter, I aim at examining different stakeholders and their institutional logics and accountability relationships. In expert interviews the experts were asked to describe institutional logics of their own organisations. Experts also described logics of other stakeholders, and potential contradictions.

Government and ministries

The role of public bodies and public policy is central for large scale transition to bioeconomy. National governments are subject to European Union level policies and harnessed to execute European Commissions Green Deal. The governmental bodies primarily responsible for initiating collaboration between different actors and providing funding for these types of projects are the Ministry of the Environment (EM), the Ministry of Agriculture and Forestry of Finland (MMM), the Ministry of Education and Culture (OKM), and the Ministry of Economic Affairs and Employment (TEM). Finnish government has also founded

National Bioeconomy Panel (Biotalouspaneeli), which is a collaboration platform between governmental bodies, researchers and businesses. This body councils and advises the government in execution of Bioeconomy Strategy and national schemes. Although most of the hands-on development takes place in meso- and micro-levels, national agenda was frequently mentioned brought forward in expert interviews as a background that sets the stage and frames in which hybrid arrangements operate.

> "It is vital for your research [this thesis] that to bring it into as a background what is going on in EU-level in bioeconomy development and what goals there are in EU level. On the other hand, what are Finland's national goals? These background factors influence on how funding is available to projects in these fields and what is the big picture that we aim at."

Public policy has a tricky dual mission: Simultaneous economic and sustainable development. Public bodies aim at harnessing different institutional logics for system development. Many policy debates reflect clashed between different institutional logics. Political mandates were noted to influence hybridisation in expert discussions, especially through different steering mechanisms and available financing options.

Public investors and public financing

Public financing has a central role in bio-sector as an enabler of innovation work. In hybrid context financing bodies and instruments may have large yet hidden impacts. Primary responsibility on financing collaborative platforms and hybrid projects is on Business Finland (former Tekes) and Academy of Finland. Business Finland is directed by the Finnish Ministry of Employment and Economy (TEM), and Academy of Finland work under the Ministry of Education and Culture (OKM). In addition, regional bodies channel European Regional Development Funding (ERDF) under their own jurisdictions. Financing works as an important steering mechanism and was frequently brought up in the expert interviews. As already noted, increasingly mixed financing models typical for bio-sector were considered to influence institutional logics and accountability relationships in hybrid organisations. Investors were noted to have central influence on how disorganised of uniform hybrid arrangements are.

> "So, the financing body defines what the logic will be, or how disorganised or unified it is…"

Multiple accountabilities present in hybrid organisations have been noted by many authors to fundamentally impact functioning of these systems (Johansson & Vakkuri, 2017; Ebrahim, Battilana & Mair, 2014). Expert answers reflected strong accountability relationships between the hybrid arrangements and the public funding body. Experts also noted that the sources of funding in bio-sector are becoming more diversified. They may work as a mechanism that stimulates blending of different institutional logics. Even a single organisational entity may have divergent funding arrangements that influence its accountability relationships, and these arrangements may also impact institutional logics:

> ”Well, yeah, I am not so familiar with other field, but yes, these activities [in bio-sector] are more and more going to that direction [hybrid], that when we want results, even within one single organisation – and here I am naturally speaking about my own organisation – Well of course we have our own strategic funding that is specifically targeted for certain research projects… where it goes all in the same way and there is one single funding source, or money from the ministry or whatever it is. But now more and more funding come from multiple different sources, and it is very active… that the money is being searched from different places.”

Financing works as a steering mechanism that deeply impacts both goal setting and goal alignment and defines how performance in many bio-sector hybrids will be measured. Due to accountabilities towards their investors, the interviewed experts noted that sometimes organisations need to prioritise investors terms over their own goals, and steering effects are negatively impacting project outcomes. Based on interview results, financing may also work as a boundary object that mediates and structures the logic of a hybrid organisation. It is perceived as central in getting especially SMEs involved in bioeconomy development and in encouraging companies to solve societal problems.

> “It really much depends on the financing body and conditions of the funding, what type of money is brought in. For example, many public funding sources have this rule that direct product development is not allowed, and it has to be in level of more basic research or type of development at prior stages. And then we have this issue that how do we fund direct product development or running the business? Different money can be used in different purposes, but in my opinion public money, well I won´t say it is easy to get it, but it is possible. The businesses may not be able to contribute their own resources, especially if we have a very small company or a new enterprise at its early stages, then there must be some money that allows them to run these kinds of operations.”

> “If you consider for example funding provided by Business Finland, they require lots of contribution from companies or this in-binding, and often it is solid money instead for example work contribution, and even it would be contribution or work hours, in SMEs that is a big issue. That there are not enough money or resources.”

Investors were noted to have crucial role in steering organisations towards multi-organisational and cross-sectoral collaboration and driving hybridisation in field level. Due to the strong steering mechanisms of the financing, the experts noted that these instruments should be carefully designed and tuned in a way that not only motivates the organisations to work together to meet the specifications set of goals determined in the financing agreement, but maximises their potential impacts. These instruments should capture both logics of external stakeholders and logics of the organisations that take part in jointly funded operations and combine these logics in a meaningful way. Many of the interviewed experts perceived the current financing modes as partially problematic:

> “At the moment different projects are usually not working together because investor often does not demand it, so there is no motivation and no time. That is something that I have been wondering the whole time in this project world, that why is the financing body not demanding that projects should collaborate? Currently, and it has been that way, always, that when you apply for funding, you need to describe in your application which projects you will work with and which projects the present project is linked with, but then when you are executing it, the financing body is in no way controlling or asking that have you cooperated with that other project. So, it is like this excessive [workload], and when you are managing several projects at the same time you have so much to do, and then you are just focusing on that. And when the financing body is not demanding it there is no motivation.”

> “The challenge in projects and for example in EU funding is that the operators may know best what the right evaluation criteria would be, and when the criteria come from so high above it does not always reflect the reality of the situation.”

Tampere University

Public research and education institutes and public-private partnerships for research and innovation

Universities and education institutes, public research institutions and quasi-governmental research organisations are important actors in Finnish bioeconomy. The public research institutions engaging in bioeconomy-related research and development under the coordination of their corresponding ministries are VTT Technical Research Centre of Finland Ltd (working under the Ministry of Economic Affairs and Employment), and Luke Natural Resources Institute of Finland (working under the Ministry of Agriculture and Forestry of Finland). Luke and VTT are working under the mandate of their corresponding ministries, and accountable for them. In addition, Sitra, the Finnish Innovation Fund operating directly under the parliament takes part as a think tank as well as a public investment company. These specialised institutions are often active parts in bio-sector in innovation-oriented hybrid arrangements. National Bioeconomy Strategy involved SHOKs (Concentrations of Strategic Capabilities or Strategic Innovation Clusters), which are sector-specific strategic units or platforms under management of Business Finland (formerly Tekes) and their own shareholder's. Quasi-governmental and partially privately-owned non-profit CLIC Innovation Oy/Ltd (formerly Finnish Bioeconomy Cluster FIBIC Oy/Ltd and CLEEN Oy/Ltd Cluster for Energy and Environment), is important strategic innovation cluster in bio-sector. CLIC Innovation is partially government owned, but other owners include Finland's largest forest-, energy-, and waste management companies including Neste, Metsä, UPM, Stora Enso, Fortum, Gasum, Elenia, Kemira, Helen, L&T, and Outotec, and number of other corporations, as well as Finnish universities that have activities in bio- and cleantech sectors (Altogether 30 companies and 17 universities). The goal is to facilitate innovation in three main thematic focus areas: Bioeconomy, circular economy and energy systems. CLIC Innovation is a bio-sector hybrid itself, but its role is to facilitate innovation through hybridisation, and create new hybrids systems, mainly Public-Private-Partnerships (PPPs), that aim at developing new value-added biomaterials and cellulose-based products for the global marketplace.

Institutional orders and goals reflect macro-level logics in public sector, and mandates from their corresponding ministries.

> “In a way the political… What is being emphasised at that moment, and these societal questions align what kind of research programmes for us come and are being delivered… So they can be these kind of global questions, related to carbon sinks, climate change, self-sufficiency issues have come up… resources, smart utilisation of raw materials, and even now suddenly we have COVID-19 funding, so like how our institution can in some way support preparations and resilience in post COVID-19 corona time, and suddenly new project applications are being kicked off, where e.g. anti-viral compounds are being searched from certain [bio]-material”.

Public research institutions have inherited dual role arising from political agenda and public policy, and hybridisation in the form of market logic being applied in research operations was noted by the interviewed experts. Research institutions accountability relationships are also increasingly multifaceted, because they are increasingly externally funded.

> “Our perspective here [in public research institute] is – the bioeconomy that we take part in – is researcher and development related utilisation of divergent natural resources, which we want to move forward with our own actions and of course create that knowledge base that the policymakers utilise in their decision-making, whether it [knowledge] is related to global issues like carbon sinks or whatever, and that is maybe more environmentalist perspective, but that another pursuit is to find new business opportunities ----”

> “We are trying to kick-start big innovation projects in this bioeconomy field, even create ecosystems, which then little by little would develop into commercial direction. And into business ecosystems. but the goal is that we could bring these different actors in bio-sector together and encourage them to work and develop things together.”

Tampere University

Regional development and regional bodies

In regional level, The Centres for Economic Development, Transport and the Environment (ELY Centres) are responsible both for funding and development of regional economics, as well as environmental protection and governance, and partake in regional bioeconomy projects. Regional Councils are statutory municipal authorities that operate as regional development and regional planning authorities, and another body that takes part in bioeconomy developments. Regional Councils also channel European Regional Development Funds (ERDF) investments. Regional development stems from strategies of these bodies. Regions have Smart Specialisation Strategies (S3), which have been launched by the European Commission's Directorate General, REGIO, on regional and urban policies and been effective already for few years. S3 strategies are thematic strategies that support formation of regional innovation networks and clusters on areas the regions have themselves defined as their focus. S3 strategies are connected to European Integration, and channel EU-funding to regions, especially funding targeted for Innovation through Horizon 2020 funding scheme. Smart specialisation strategies were discussed in expert interviews. In triple-helix type innovation schemes regional bodies, regional funding, and through them S3 strategies were often present.

> "Smart specialization is an order from the EU level for the regions, that each region must make a smart specialization strategy as a condition for getting that regional EU money channelled to its own territory. It has now been this way for some time, and it will continue in these coming funding periods that the regions need to define that kind of thing, what are their key differentiating factors."

> "Financing body has these priority areas on which this project is based on, that is, we have specific areal funding, and their number three priority which is to promote innovation. So, from there we get these goals for the projects that lean on S3 strategy."

> "--- Central Finland good example of a region that has strategically decided to make the bioeconomy their focus, and they have also built international bioeconomy networks. It is really interesting, and of course there are lots of bioeconomy-related projects and all EU funding is then harnessed to it. But there the whole region is involved and invests to research on this field. They want to profile themselves as a region and gain international visibility and be strong players in bio-sector. And there the public actors strongly support the vision that Central Finland as a region profiles itself as a centre of bioeconomy, and especially they support new innovations."

Multinational enterprises and large corporations

Large industrial bioeconomy players in Finland are centred mainly on forestry and forest-based biomass. Out of these companies, many are placing bioeconomy in the centre of their operations but typically work according to corporate for-profit institutional logics, although for example Dahlmann and Grosvold (2017) recorded how firms face variety of institutional demands and different individuals within the system engage in institutional work to respond to these competing logics. Businesses are increasingly exposed to different logics, and their engagement in bioeconomy development is largely a result of melding both environmental protection and business principles. According to Dahlmann and Grosvold (2017), environmental logics are becoming increasingly relevant in field-level. The role of MNEs in development of bioeconomy is perceived to be central, and multinational enterprises take part in many hybrid organisations in the field. Multinational enterprises were described by interviewed experts often as hierarchical and bureaucratic. Individuals follow codified practices and corporate protocols, and decision-making processes take time. Projects may require internal selling within the corporation. Large corporations have plenty of R&D capacity of their own, and whereas smaller corporations may be interested in hybrid activities to pool resources in order to survive, motivations of multinational enterprises may be elsewhere. Legitimacy considerations may be the driving force in MNE hybrid participation.

> “In large corporations you have this whole organisational history and these chains of accountability.”

> “Then we have these companies like Metsä Group, large forest-sector giants which have their own R&D units. But still others are there in their side, and they may have their own special goals and needs, for example these that emphasise logistics and handling of new types of materials, and of course they are focused on getting products into the store shelves. And that makes it always a bit different in these large-scale projects.”

Tampere University

SMEs, start-ups and start-up hubs

While bioeconomy development and bio-innovations are often attributed to large multinational enterprises, disintegrated bioeconomy concept (Kokkonen, 2012) shifts focus towards SMEs (Kleinstadt et al., 2014). SMEs in Finnish bioeconomy contexts represent heterogenous group of companies from various fields and sectors. They also represent greater heterogenicity in institutional logics and may be for example social enterprise type of organisations driven by environmental logic. Many of the SMEs are highly specialised and as one interviewed expert stated, results from extensive academic or industrial career, and as result key individuals may be accustomed to different logics and conventions. SMEs and especially smaller star-ups may be formed around hybrid arrangements (such as companies that are involved in a value chain of a certain biomaterial) or actively involved in hybrids in order to pool resources and survive.

> "My opinion so far has been that the tier number or the total number [of start-ups] is very small, because it requires that they have acquired deep expertise either as a result of academic career or industrial career, and then the entrepreneurship is so very challenging because it is very expensive to upkeep laboratory spaces and acquire made-to-order machinery, so the number of entrepreneurs in the field is not that high."

> "Many of the companies are small and they do not have enough resources to control the material flow and the whole logistics chain, so they in a way live in this kind of symbiosis with forest industry, because they benefit from the material chain, which means harvesting the material, its logistics and even refinement, because there are many firms utilise only the more evolved steps in the material chain."

Because SMEs do not have consortia structure and lack bureaucracy of large multinational enterprises, they were perceived to be more agile and flexible partners. Especially in bio-hubs open information sharing, solving sustainability challenges and creating new inventions are important ideals and operating principles, although in practice lots of the operations may still take place in forms of bilateral agreements between the executing organisations.

> " When we started our [hybrid] organisation, openness and information exchange were in key position. We had companies operating in very different fields, and of course everyone maintains their own corporate secrets and confidential issues, but it is a difficult field, both entrepreneurship and business development, and chemistry and understanding forest biomasses are needed. So, we have this culture of sharing of knowledge and know-how, and

it has worked well. For example, if we think that someone has lots of expertise in polymer chemistry and someone else has this problem that some substance precipitates, then they can help one another and share their expertise. And it does not hurt what other one is doing."

"I have had this privilege to work in an environment free from historical opinions and presumptions of big corporate players. People in this type of innovation environment look ahead, and these inventors are not really focusing on whether this works in our corporate group or do whom they have to bow, instead they are taking things forward."

"You would like to do so much, but you often have just very limited resources. For a small company just dedicating the working days into something is a big question, and in bigger organisations it's like there are so much resources, the scale is completely different.

6. IMPACTS OF HYBRIDITY ON GOALS AND PERFORMANCE IN BIO-SECTOR HYBRIDS

6.1. Goal setting practices and principles in hybrids

In the last chapter, I reviewed institutional logics, different actors in Finnish bio-sector, accountability relationships, and their interdependencies. I have discussed role and importance of hybrid operations for the sector as a whole, and hybrid organisations potential to foster transition to bioeconomy through innovation and creation of new products, as well as new operating models. The challenge is that this divergent group of organisations should find enough common nominators and a way to operate together in a meaningful way, despite multiple and potentially competing logics being present within the same arrangement. The resulting arrangements should combine institutional logics in a way that allows collaborative arrangements to create value beyond any single logic. In the following chapter, I will examine how organizations in bio-sector try to combine different logics, discuss findings related to goal setting in hybrid organisations, and investigate how institutional logics and institutional work impact goal setting in bio-sector hybrid arrangements.

Joint goal setting and collaborative goals

Target setting has become a widespread tool in strategic management according to Rantanen, Kulmala, Lönnqvist and Kujansivu (2007). Järvi, Almpanopoulou, and Ritala (2018) emphasise that any multi-partner collaboration - Especially the types that aims at new knowledge creation - Requires some level of joint target setting and collective action toward the shared goal. Target setting in hybrid arrangements needs to combine institutional logics of multiple sectors, and at the same time has a role in constructing new hybrid logic. This poses complex problems for goals setting, as hybrid organisation may have plural, sometimes conflicting, goals. Goal congruence or incongruence are both typical in hybrid settings (Johansson & Vakkuri, 2017). Congruence is a result of organisations aligning their goals in order to achieve an overreaching mission, while in goal incongruence different goals contradict each other. Interviewed experts were asked about goal setting in practice and instruments the organisations used in mediating their different goals, ambitions, and targets.

All interviewed experts emphasized the importance of a common goal. Experts used different terms to describe this issue such as “shared will”, “common good”, “shared interests” or “joint goals”. Lack of shared interest was, naturally, noted to significantly complicate hybrid activities:

> “What is terribly important is that in the beginning there are certain common goals that everyone strives for. Then the orchestration and management of the whole organisation will be easier, but if in fact everyone has their own goals and they don’t really find that much common, then that’s truly challenging, and this easily leads to activities that are quite detached and disintegrated.”

> ”There must be narrative for every meeting, some good reason to be there besides just to hear what everyone´s been doing lately. There should be some goals set for each meeting, and the goal setting is very often forgotten. And the goal cannot be that we get investments, it needs to be something else that really is interesting and benefits the bodies involved.”

> “Of course, there are partners that you would really like to get, that would have an interesting profile. But if they do not have the will, if they are not willing to participate, if they do not see any benefit, it just won´t work.”

> “Goals should be shared, so that everyone is committed. Previous ecosystem experience helps but is not necessary. Open dialogue and joint planning are crucial.”

Most of the interviewed experts highlighted that the hybrid organisations goals should be to some degree in line with individual partners own goals, and organisations were described to evaluate potential partnerships based on their own strategy and values. The goals of a hybrid cannot be detached from the institutional logics of the organisation. In this sample hybrid arrangements were typically voluntarily formed around bio-innovations and bioeconomy advancement. Based on the expert interviews, goal alignment was stressed at the early stages of the process. First degree, and often the most throughout evaluations, were simplified in or out decisions, where organisations defined whether hybrid arrangement was interesting enough from their point of view and worth their participation by rationing and reasoning guided by their own logics.

> “It is that simple, really – Yes or no. Are you in or are you out?”

> “We too are asked to take part into many projects and sometimes I feel that when the one of the criteria of getting the funding is that there is representation of business representatives in governance boards then it often comes to us because we represent sort of the sector, so from our perspective, we need to bonder what is there to gain and what are the benefits, what goals there are and who else is involved.”

"Naturally we need to consider our strategy and goals. We cannot get ourselves involved into just about anything. It needs to be in line in our strategy and our goals."

Agency and institutional work in hybrid goal setting

While institutional logics lay out conditions for organising new hybrids, agency of individual actors constantly intercepts this process. Few of experts discussed the role of a project manager in mediating between different goals. Hybrid, network, or ecosystem experience of a project manager was perceived as a positive factor. Diverse accountability relationships are part of hybridity, and although they may create challenges, they are not something that hybrids should try to minimise, but instead manage. Several experts, related to this issue, raised project managers experience as an important factor. Weber and Kahdemian (2008) have discussed collaborative capacity builders (CCBs) and CCB mindset in knowledge-intensive networks. According to the authors, collaborative capacity builders are actor in the network that think of networks as mutual-aid partnerships (promote collaborative behaviour and perceive others as partners) and understand inseparability of performance and accountability, in other words, have ability to demonstrate accountability to a wide range of stakeholders. In hybrids, these actors recognise plurality of institutional logics. Weber and Khademian (2008) underline that in cross-sectoral network, CCBs are not necessarily governmental actors. Instead, CCBs can be any network participants. According to the interviewed experts, skilled and experienced project manager can tie together goals of financier and current policy and practical goals of individual project actors and create cohesion over the system as a whole. Intentional and conscious institutional work is carried out in early stages of hybrid development, where individuals try to meld different goals together and create goal congruence.

"--- That the person that manages the project has wider perspective on what he/she is doing."

"It really depends, in this project world, on who is managing the project. Who is the head of the project? Who leads it and who has experience to do it in a way that she/he can adjust to…? Despite that financier is demanding this or that --- We have, in field of bioeconomy, these experts that pretty much dedicate their whole career to developing the field, and when these individuals are in lead usually they have the expertise to see the big picture."

"It is about understanding daily realities especially from business-side of things, and that SMEs think differently compared to large corporations. That is something that needs to be understood in this hybrid reality, that you cannot

> use the same language all the time, or some technological terms - Let alone academic terms. They are not always understood, or they are understood incorrectly, or they place emphasis on wrong issues. You need very humane and emphatic leadership in managing these types of arrangements."

Couple of the experts underlined that although hybrids need active agency and management, governance does not mean domination over the system or overrule of one institutional logic. In many cases not only the individual, but one of the organisations has a leading role. Ménard (2004) notes that asymmetries in bargaining power may threaten continuity of hybrid ties. Thus, it is important to note that the role of a hub firm or keystone organisations is to coordinate and align, rather than exert power, over other organisations within the network. Valkokari, Seppänen, Mäntylä, and Jylhä-Ollila (2017), for example, distinguish keystone actors and dominators. The experts also reflected this distinction in their answers. The expert's consensus was that facilitating structured dialogue between different bodies is fundamental task of the managing body. Experts stated that the arrangement needs to be ´attractive enough´. Although the experts were not specifically questioned on the issue, few interesting points were raised. One expert stated that in early dialogues one of the goals was to convince the potential partners of the organisation's expertise and skills on the matter at hand and motivate others to form partnerships. Another expert noted that often already in early stages, especially in hierarchical or multi-divisional organisations, individuals working in interface between hybrid arrangement and partner organisations may face situations were hybrid arrangement is perceived as detached from the parent organisation or not considered as part of organisations core operations. In these situations, institutional work goes into legitimising hybrid operations within partner organisation. Following extracts describe problem between hybrid interface and expert's own organisations:

> "In a way it has been easier to collaborate with other organisations in our ecosystem rather than internally [within experts organisation]. ---- Maybe it is this mindset, if we want the activities that we have done in the project to become something that we do every day in future, we need to cooperate all the time, do that work together. That it is not this sort of one person's own thing, but we as an organisation need to move it forward. And that is still to be clarified"

> "It is true that often in hybrid interface we get things to work, but when we move from there deeper into our own organisation, implementation can be even more challenging than in hybrid interface."

Approaches towards multiple institutional logics

Hybrid ideal is that institutional logics would complement each other, and new, hybrid logic would be formed (Ebrahim, Battilana & Mair, 2014). Research logic combined with environmental logic would create innovations that business logics would be able to rapidly commercialise. Based on interview results, institutional logics were not typically readily complementary. Actors were recorded to employ a whole palette of approaches when negotiating common goals between stakeholders with different institutional logics. Interviewed experts were asked how organisations participating in hybrid projects and arrangements can in practice combine heterogenous multi-levelled and multi-actor goals and deal with inherent differences in their institutional logics. The experts were also asked how institutional logics present themselves in hybrid arrangements, and whether the experts felt that new hybrid logic were formed. Most of the experts were positive that even heterogenous organizational goals can form some type of a symbiosis with careful planning. When goals are abstract enough, all parties can contribute, but this may result into de-coupling and merely symbolic adoption of policy while organisations maintain operational practices without changing the actual modes of operations. Results indicated, along with earlier findings, that when goals of financing body did not compel to the realities of the executing partners, de-coupling logics of financier and logics of partners helped organisations in alleviating this conflict. Research institutions, for example, were described to use material accumulated throughout the joint project later for their own publishing.

> ” In these types of settings, there is never a situation where everyone can do the same thing. We have certain parts of our operations that clearly similar logics and environment that they share.”

Organisations were noted to be ready to compromise in some areas, although it was rarely the primary approach. Compromising approach was often conditional and required some form of greater benefit to be achieved in situations where organisations give in on their own logic and adapt to other logics.

> ” In our management system we emphasize system-wide governance and process thinking throughout the whole value chain. And these two angles mean that in some thing compromises must be made, even in very big things. We can be talking about ten million investments that are applied and we are looking for right actors to be part of it.”

Selective coupling as observed by Pache and Santos (2013) was described by the interviewed experts in several occasions and seemed as predominant approach when

dealing with potentially conflicting or parallel logics. Expert noted that often multi-levelled goals and targets are beneficial, and different institutional logics can help organisations in meeting different goals. Johansson and Vakkuri (2020, forthcoming) discuss these issues when examining hybrid approaches to value creation. Selective coupling is widely applied approach when organisations face different value-creation logics and as result have conflicting goals. In this approach, hybrid organisations do not appropriate one overreaching hybrid order or total structure of logics for specific joint goal, but instead use multiplicity of institutional logics inherent for the arrangement to serve several different purposes (Pache & Santos, 2013; Johansson & Vakkuri, 2020, forthcoming):

> "--- When we see that the goals from the financier that come from the EU strategy towards bioeconomy are top-level goals, and then if the organizations, our partners, have their own goals, then they are very concrete, and can be easily targeted under these larger goals. And in a way, the organizations that are involved are in some way connected to the bioeconomy and through that to these macro-level goals. So that the values are the same, so to speak."

> "Yes, we *can* combine goals, for example if we have some raw material that is being studied, and we find some interesting chemical compounds or fractions, or the process is interesting and new, and we can get something that can be utilised in some product whether it is food or cosmetics or whatever, and then possibly some side stream that can replace something fossil-based or synthetic, then everyone can have something they can utilise because then the research organisation can publish the results in the end, company gets a new product, and financier can follow on how many new products were developed, or how the project builds new value chains or have we been able to reduce waste streams or take into account some environmental perspectives."

> "--- That the right operation modes need to be found. I have experienced this through EDRF-projects [projects funded by European Regional Development Fund]. Because in that place goal-setting can get quite tricky, because these regional development projects, even though the main executing body would be a public research institution, the research or research publications are not that [the goal] – I mean because my institutions fundamental objective is to do that kind of research that is in the end published and it becomes for example an article published in a scientific journal – but this is not the EDFR investors goal. Instead it is to develop those regional strengths which are there at that time. And businesses should be involved and so on in steering the project. So even though we are doing scientific work there, it cannot be the goal. Naturally a publication is a positive thing, but not a priority. This means that we may execute actions that are not that influential from our point of view. But it is this kind of combining and compromising."

> "In hybrid operations we can combine diverse logics, and different logics can aid different sub-goals. For example, research logics aids in obtaining new information that is needed for environmental protection. --- Different institutional logics help in achieving different sub-goals. In well written projects there are no contradictions."

Pache and Santos (2013) described in their multiple case study how social enterprises with commercial and social logics used selective coupling approach to demonstrate external

legitimacy on different stakeholders by coupling intact elements of each institutional logic present in hybrid arrangement. As earlier stated, this approach helps organizations to deal with conflicting logics without excessive compromising or dialogical processes but may create dissonance and divides between conflicting goals and logics, and disintegration within hybrid system. When experts were asked whether new logic was formed in hybrid arrangements, most of the experts perceived hybrids rather as a sum of institutional properties of the key partners rather than a new entity. Even conflicting institutional logics were complementary at their best, but they rarely were combined into a new hybrid logic. However, it should be noted that many of the arrangements were new or temporary, and changes in institutional logics have been recorded to be long evolutionary processes and take time. Different approaches may be adopted as the systems evolve.

Goal alignment in practice: Micro-foundations of mixing logics

Due to the perceived importance of goal alignment between partner organisations, careful partner selection was exercised based on combability of organisational goals and institutional logics. The experts underlined the importance of goal alignment already in very early stages of the development. To ensure that all partners are able to contribute to common goals from the beginning and institutional properties are somewhat compatible, many of the experts brought up diverse partner ranking and partner profiling processes. Organisations profiled and selected partners based on cultural similarity, shared challenges and interests, and supplementary capabilities. This indicates institutional logics shape organising principles in early stages of hybrid development when logics or actors that are perceived to be ´incompatible´ are excluded from the arrangement.

Järvi, Almpanopoulou, and Ritala (2018) mention boundary objects, such as trading zones or representations or work, as a significant instrument which may help in knowledge-sharing across traditional organisational boundaries. Mediating, revealing, and enabling multiple goals, open disclosure of intermediate outputs and selective disclosure of valuable information, according to the authors, are noted to enable cross-boundary work. One of the points of interest was institutional work and material practices that constructs hybrids, and how they influence goal setting and performance systems in hybrid arrangements. Experts were asked about different practices and practical instruments, and how they are used in

joint goal setting and alleviating the tensions between different institutional logics. Answers reflected heterogenous practices and strategies that organisations employed in cross-boundary settings. In expert interviews, different boundary objects, material practices and socially constructed technologies that mediated goal setting in bio-sector hybrids were discussed. Organisations used workshops, annual strategy panels, unstructured one-to-one discussions, short pitches or elevator talks, seminars, panel discussions, presentations, and short introductory meeting or firm dates. Along with these interactive activities, organisations used different digital platforms and technological instruments to facilitate their dialogue.

Nicolini, Mengis, and Swan (2012) have explored objects beyond boundary objects and made couple of interesting observations: According to the authors, increased cross-sectoral participation was observed when objects were open, required investigations, and represented challenge or a puzzle. The authors called these type of puzzles epistemic objects. In bio-sector hybrids were there was external funding granted based on pre-defined criteria, organisations were noted to work on their targets through the financing process. Several of the interviewed experts noted that funding arrangements have a type of a mediating role. External funding may work as a type of boundary objects that on one hand create at least one shared goal between hybrid partners (obtaining funding for the project) and on the other hand financing bodies often force organisations to clear issues around ownership, accountabilities and expected results, and have an action plan defined in early stages of joint development. Some experts noted that the idea of shared goals is baked in financing, especially when certain amount of own funding is expected from all participants:

> ”… So it is this kind of combining and bundling, this hybrid thing exactly, that in external funding, if you have these massive project consortiums for example… that there must be business partners or other private sector operators and their money, and then absolutely the goal setting must be done so that everyone can benefit. Nobody comes there like well isn´t this fun, there has to be real joint interests, and that in my opinion results to hybridity”.

Financing applications could be understood as a type of epistemic objects in bio-innovation work. They bring organisations together to solve a common problem (*How to obtain funding for joint undertaking*?). Similarly, environmental problems may wok as epistemic objects that support hybrid development. Smets and Jarzabkowski (2013, p. 1301) note that everyday practices and pressures to ´get things done´ drive this gradual change from contradictory to compatible logics. Once partners have contributed to objectives of the funding body, pressures to ´get the job done ´ ties them together and facilitates hybridisation.

6.2. Challenges in hybrid goal setting

Despite often cautious approach to partner selection and clear understanding of the importance of joint goals, due to the fact that hybrids are multi-actor, multi-value and multi-levelled constellations, they tend to suffer from some common pathologies that arise from their inherent complexity and tensions between different institutional logics, as described in the theoretical framework. During the interviews, experts were asked about the challenges they have experienced when working with heterogenicity of organisational goals and institutional logics. The challenges were identified through thematic analysis. The answers reflected challenges and issues that have been described in many earlier empirical studies on multiorganisational, boundary crossing settings. Challenges identified in this study are summarised in Table 2.

Table 2. Thematic analysis on challenges related to goal setting

Goal setting challenge	Definition
External influence	Accountability relationship towards external body, typically financing entity, influences or distorts goal setting in hybrid arrangements.
Cultural distance	Institutional and operational logics of other entity are perceived as strange or foreign.
Lack of motivation and disengagement	Organisation perceive what is valuable differently or do not expect to gain significant benefits through hybrid activities and may want to follow the situation but are not actively engaged in hybrid development, remaining as silent partners.
Competitive tensions between the partners	Institutional logics are similar, but organisations cannot operate in cross boundary arrangement due to perceived risks associated with competitive partner.
Different timeframes	Private organisations time frames are shorter compared to public and research organisations time frames.

External influence

Many of the interviewed experts raised issues of multiple accountabilities and particularly accountability towards investor or financing body as one of the key challenges in joint goal setting. This challenge is widely documented in hybrid literature, and Johansson and Vakkuri (2017) call the phenomena ´multiple accountabilities disorder´. The main financing body often predefined goals, and hybrid partners role is to follow pre-defined criteria of the investor. Several experts stated that sometimes demands from the financing body may distort goal alignment in critical issues such as intellectual property ownership. Results indicated that this may result to de-coupling of institutional logics between financing body and operative actors.

> ”I see in my daily work how much requirements by the financing body and these frames that they impose steer activities, sometimes even in a way that does not results to optimal efficacy, or optimal benefit. Although external financing is needed – I will not say if in the future it comes in form of project funding – but nevertheless in some way public funding in these early stages of company’s life cycle is needed, although that should not be the guiding factor.”

> “ And then on of the curiosities in regional funding, at least before, but I am not sure whether it exist anymore, there was this specification or order [by the financing organisation] that nothing that is going to be patented should be created, and it needed to be stated [in fund application], something like “nothing patentable is created”. Which was very much in conflict with that that usually the aim is on activities that support the business, so that the business would get these new products and so on. Well then in many cases it may be so that the finding or and invention should be protected, or otherwise the business organisation will not start working on it. If it is not protected the business will not be motivated to refine and develop it. So, these contradict, that on the other hand we should try to develop something that benefits businesses, but then it can´t be patented, so then it [the innovation] needs to be detached [from the project]. Then if you think about Business Finland, it is exactly the opposite way. Often, they have as a perquisition that in order to get any funding you need to sort out intellectual property right issues first.”

> “—That when the project is funded it becomes this really complex structure, and then there is this kind of administrative work that eats away efficiency, and then what also easily happens is that it is being steered too heavily towards research side, and commercial side of the things is left behind.”

Three of the experts who had professional experience in project-based hybrids noted that financing options relate to selection of partners, and directions of the financing body sometimes demotivated in particular private sector participation.

> ”But from project-perspective I have to say that we cannot develop - for example certain specific companies - because when it is made with public money it has to benefit the larger field, and it is always so that when projects need to promote specific issues, it may narrow down companies who are willing to partake in the project.”

Because of the multiple accountabilities and multiplicity of institutional properties in hybrid settings, hybrids may suffer from excessive amount of audit systems, and overlaps in performance measurement (Johansson & Vakkuri, 2017). In this research, most of the experts were content with the state and scope of hybrid performance measurement and consider it to sufficiently govern hybrid activities in arrangements they were involved in. What was noted in the expert interviews was that accountability towards the funding body in project-based arrangements may mean that goals defined by the financing body are emphasised, and there may be dissonance between goals of the financier and goals of the executing organisations. Although nearly all interviewed experts spontaneously mentioned funding and majority felt it had significant impact, the degree in which it was perceived to influence goal setting varied. Another expert stated that logics of the financing body do not have a significant role in goals setting, and that the conflicts related to ownership and financing can be effectively alleviated by open dialogue between the partners:

> “It [work] is by no means affected by any financial contribution, or by the main partner pursuing their own goals. We [in this hybrid organisation] have a very open culture of dialogue, and the goals are defined in terms of how they best benefit everyone, so that we would have as many nodes as possible.”

The question of external influence may be more relevant in innovation platform and triple-helix type of hybrids that are typically externally funded, but degree of external funding and its influence varies. Financier is not the only external body that potentially can have an impact on hybrids goals. Johansson and Vakkuri (2020, forthcoming) discussed pressures to legitimise value-creation to external audiences.

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Cultural distance

Sometimes institutional logics present in hybrid arrangements are incompatible, or strange for other participants (Smets & Jarzabkowski, 2013). Many of the experts mentioned challenges related to structure of the institutions and their organisational cultures. Particular attention was paid to decision-making processes and practices, management protocols, bureaucracy and communication culture in partner organisations. Experts felt that historical inferences coded in organisational memory of a large corporation, their strict policies and their hierarchical processes complicate operations in hybrid environments. Smaller, more agile organisations were perceived to be easier partners.

> ”Organisations may have their own… even the way they operate may restrain joint development.”

> “Well there is this problem at least in these types of consortiums, that the decision-making ability of the companies – Will they partake or will they not – varies. And then it is noticeable that with small companies all it may take is one phone call. They decide immediately, yes or no. But bigger the corporation are, the organisations can get so big that if you are not speaking with the CEO the decision will take time, they´ll think and they´ll ponder and then these different divisions are discussing with one another and the other one does not know what the other one is doing. One [division] may be eager to participate, but when you speak with somebody from another division, they are not at all interested.”

> "In smaller organisations decision-making and in general getting things to move forward is much more straightforward.”

Information sharing and open dialogue were identified as another central theme. Institutional logic of scientific research idealises open information and knowledge sharing, while institutional logics that guide practices in for-profit corporations emphasise importance of corporate secrecy and intellectual property ownership. Clashes in between these two logics are evident and were described in many interviews, although the experts noted that communication and information sharing culture can be vastly different in different business organisations. Nevertheless, in private sector institutional logic favours secrecy and controlled information distribution, whereas in public sector and research organisations open information distribution and full transparency are important values.

> ”One of the challenges that we have identified in ecosystems is that open sharing needs to be system wide, that everyone needs to be open in same way, and that openness enables that corporations own business-… that they

do not have to open all of that. Openness means that information that is crucial for the development of the ecosystem is brought into the ecosystem. It does not mean you need to open all your IPR issues."

"Maybe collaboration is easier with other businesses than with public organisations in a way. Maybe they appear as bureaucratic, and when activities are public then there is this question on what issues are public and what issues remain private and confidential. Maybe it is easier when partner is another company."

These findings are in line with earlier empirical studies on common pathologies in hybrid organisations. Rajala, Laihonen and Vakkuri (2019) identified clashes in culture and lack of common language as significant barriers to performance dialogues. Sarrico, Rhodes, Halligan, and Conaty (2012) had similar findings related to cultural clashes and tensions across priority objectives of different stakeholders. Individuals have been described as important carriers of institutions. Experts interviewed for this study noted that although early stages in particular with large bureaucratic organisations may be difficult, in practice different organisations communicate through few key individuals who are committed into the social rules in the hybrid organisation and can mediate between the joint arrangement and their corresponding organisations.

Competitive tensions between the partners

Market logic may result to perception of others as competitors and interaction with other organisations as a business game. One of the interviewed experts noted that one of the key challenges in joint goal setting is that the business partners may be competitors, and their willingness to work together and share information and their own knowledge limited. Few of the experts noted that when selecting partners, competitive tensions should be avoided.

"When drafting bigger projects, we almost always run into this that the three of Finland's largest forest companies are competitors with each other, and that what they agree to do together is an interesting question every time we are working on something new. Perhaps one of the ideas we have here is to do something that is little further away in the future. Not to do something related to the company's business today, but that the goal must be further. In pre-commercial research even these three can work together."

"When we started to search for companies to the area the idea was that they would not be competitors but instead they would have synergy."

> “If there are competitors then the partners need to carefully consider what information can be shared. It inhibits openness of dialogue.”

Territorialism and protectivism have been described also in earlier works, and encountered and identified for example by Rajala, Laihonen and Vakkuri (2019). Kunttu (2017) noted that organisations willingness to cross boundaries was partially dependent on perceived risks associated with sharing information with partners in R&D alliance. A though that was brought forward in many discussions was that partners should someway be able to complement each other’s resources and capabilities and should not be in a competitive position. Although very different institutional logics can complicate collaboration, organisations with essential similar logics may not work together well either, if their actions are guided by market logic. Kunttu (2017) emphasises opportunistic behaviour as a significant problem in knowledge-intensive cross-boundary collaboration. Same observations have been made in ecosystem research. Valkokari, Seppänen, Mäntylä, and Jylhä-Ollila (2017, p. 21) state that “firm-centric strategies too often end in “winner-takes-all” settings in ecosystems”. In highly specialised field such as bio-industry and cleantech intellectual property ownership and specialised knowledge are carefully treasured and nurtured strategic assets. Sharing valuable knowledge exposes organisations to opportunistic behaviour, where one network participant exploits these assets to their own advantage. If risks of sharing knowledge are perceived to be too high, organisations are willing to share and contribute, even it could benefit the arrangement as a whole (Kunttu, 2017). Dryer and Singh (1998) addressed ´paradox of trust´ in their work on relational competitive advantage: When there is more trust, organisations exchange more valuable information, and risks for opportunistic behaviour becomes greater. Hybrid organisations ability to prevent single actors from taking advantage over others is central element in developing collaborative capacity. As stated by one of the interviewed experts, when goals are general and future-oriented, competitive rivalry may be avoided.

Lack of motivation and silent partners

Lack of motivation has been frequently mentioned as one of the common problems in hybrid organisations. Rajala, Laihonen and Vakkuri (2017) have described motivation challenges in hybrid performance dialogues. The authors identified both extrinsic challenges caused by hybrid organisations inability to sanction disciplinary measures in cases where member organisations are unresponsive. The authors also noted intrinsic motivational challenges, where organisations were simply not interested in each other operations or results. In selective coupling and de-coupling approaches this may be the case, when each organisation continues to fill a specific role under their own institutional logics. As Rajala, Laihonen and Vakkuri (2017) state it was "not easy to create topics that would interest all member organisations because the organisations had very different tasks". Problems may be connected to task allocation, cultural distance, or external influence, for example goal incongruence caused by financing arrangements.

> "There are actually so many reasons for that [silent partners], the biggest reason is that the company does not think that this is or that it will be a part of their core business. Quite often they don't drop out altogether, but instead want to follow the situation from up close."
>
> "If the team meets rarely and there is little actual joint work, it easily gets really disintegrated."
>
> "There are silent partners, not often but there are. It´s important to get everyone on board".

Lack of motivation may lead to de-coupling of institutional logics and merely symbolic adaptation of hybrid principles, while partners continue operations as usual. Motivation may also be linked to drivers of cross-boundary collaboration. Different organisations are motivated by very different drivers. Innovations in bio-sector are highly ambitious and as sustainability is becoming increasingly important part of organisations reputation. The value of innovations for organisations goes beyond their direct impacts. One of the themes that was brought up by the experts not as a direct challenge, but one particularly critical issue in hybrid goal setting was distribution of the credit: If the joint project succeeds, who gets the honour? Some of the experts felt that especially big and ambitious organisations at the front lines may want to pursue innovations and bioeconomy development on their own, or on their own terms. Organisations often cross their boundaries to supplement their own resources and capabilities, and go through *make, buy*, or *ally* -decisions (Kunttu, 2017). Resourceful

organisations can end up in *make* -approach, and are not as motivated to partake in cross-boundary work:

> "But that that how strongly we want to do it together, and how much different actors want to do it alone and get the full credit from their work."

Different time horizons

Differences in time horizons has been mentioned in earlier hybrid research as one of the common pathologies in cross-sectoral hybrids. As mentioned earlier, institutional logics shape how actors organise their time and space. For example, logics of academic research are vastly different compared to logics of start-up world in how time is perceived.

> "Compared to start-up world, bigger institutions and these research organisations move incredibly slow. In SMEs everything needs to happen fast. You have limited resources and if you harness them into something, you need to get something tangible out of it quite fast. So especially R&D timeframes are very different."

Organisations need to be able to somehow manage their temporal differences. Even in two large institutions, there may be differences in terms of how fast work should be progressing. These differences may influence how efficiently hybrid is able to pursue its goals and available opportunities such as funding, as following comment demonstrates:

> "You´d think that research institutions can be quite stiff compared to agile small enterprises, that can just make the decision, buy some machinery just like that. And then… The big firms cannot do that, they can be even slower. The problem with this culture is that if we are applying for funding for some big consortia, we should know it a year before, before the application criteria is even published. It should have been talked through before that, so that big organisations have time to decide."

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6.3. Performance systems and control in hybrid organisations

Current state of performance systems in bio-sector hybrid organisations

In previous chapter, I examined goal setting in hybrid environment, and common challenges that arise from clashes of different institutional logics. As previously stated, different logics may help hybrid arrangement in achieving different goals (selective coupling) or complement each other. They may also be de-coupled or compromised on. In previous chapter, goal congruence was emphasised. Majority of the experts took the position that performance of the hybrid and performance of the individual partner organisations need to be aligned in some level, in other words, performance systems in hybrid organisations needs to take forms that are perceived as legitimate in partner organisations and help organisations in reach their overreaching mission. Performance systems should also reflect accountabilities as well as plural institutional logics present in hybrid arrangements.

When asked how performance systems of hybrid arrangements and performance systems of partner organisations are interlinked, the experts described hybrid performance evaluation to be currently relatively autonomous and independent from partners performance evaluation in most cases across different types of hybrids. The experts noted that balancing between hybrids performance and performance of individual partner sometimes means adjustments are needed. Within hybrid organisations, partners work to fulfil jointly agreed targets under the rules of the hybrid, but the products and results were often later used to enhance individual partners own performance. This means that although individual organisations generally did not directly evaluate hybrid performance from their own perspective, the outcomes are most likely later accounted in performance evaluations of individual partners.

> “Usually data will be accumulated. Then [in research organisation], if possible, we try to gather it and reformulate it into publishable format.”

> ”… But of course, along that [common metrics within the hybrid] we need to see business objectives, that it cannot be just advancement of research. Instead, broad observation on how the results from scientific studies benefit businesses, and what kind of symbiosis can take place within the hybrid organisation. That is an important metric.”

Although performance management was emphasised as highly contextual practice, some common nominators were identified from experts' answers. Firstly, the experts believed that having some form of joint performance management in hybrid organisation is necessary, even if the organisational ties are loose. Secondly, they believed that the metrics should be diverse enough to reflect plural organisational goals and provide enough data for evaluations that each partner needs to make on their own, on the other hand by differentiating metrics to fit for the needs of each participant, but on the other hand by creating shared and synthesised system-wide measurements. Roughly, public sector measurements were noted to focus on primarily on effectiveness of a given arrangement: Number of businesses engaged, resulting networks, jobs created in the area, or different environmental metrics. Research bodies focused on publications and their impact factors, and businesses naturally on the return of investment. However, in innovation-oriented work businesses were noted understand the nature of the work and employ more diverse metrics, including networking benefits, market potential of new technology or product, competitiveness and novelty value. Generally, the experts agreed on that the performance systems in hybrids are highly influenced by the performance systems of the partner organisations and logics present in partner organisations, and key performance indicators are tailored *ad hoc* based on the needs of the participants and the funding body.

Many of the hybrid arrangements interviewed experts were involved in were funded by different public financing instruments. In bio-sector, long-term project is a typical form of a hybrid organisation. In externally funded projects performance is typically measured by the financing body. Interviewed experts emphasised accountability towards the financier. Although most of the interviewed experts perceived measurements determined in the early stages together with the financing body to be sufficient, in some cases there were contradictions and not all which was perceived as valuable or impactful were measured. Selective coupling and de-coupling approach were reflected in performance and control systems. None of the experts described any forms of fully merged systems.

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6.4. Critical issues in hybrid performance

Critical issues in hybrid performance management and performance systems were identified based on expert interviews. Although in practice systems are highly contextual and situational, and often formulated *ad hoc* basis, certain common issues arose during the discussions. These were divided into three themes: 1) Temporal dimensions of performance evaluation, 2) Heterogenicity of measurement systems and instruments and 3) Presentation and openness of performance information. Categorisations are presented in the Table X. below, and issues are examined in detail in the following chapter.

Table 3. Critical issues in hybrid performance management

Critical performance system issue	Definition
Temporal dimensions of performance evaluation and procedural versus substantial approaches	Especially in project-type of hybrids measurement is focused on short-term results, although many of the operations may aim at long-term impacts. Causal links between inputs and outputs may be difficult to establish.
Heterogenicity of measurement systems and instruments and need for new diagnostic tools	Different organisations have different measurement instruments, and hybrid organisations need to be able to adjust to variances in information needs. Focus is often on metrics that are readily available and easy to measure. Intangible metrics and metrics that would measure collaborative performance are missing. Hybrid organisations need to be able to bundle and combine existing data and create new diagnostic tools and metrics.
Presentation and openness of performance information	Distribution of performance information and communication of performance are critical issues in multiorganisational settings. Information silos complicate work in hybrids. Due to the vast amount of data, presentation of performance information becomes central question.

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Temporal dimensions in performance evaluation and procedural versus substantial approaches

Because performance management in hybrids differs from performance management in single organisations, experts were asked about challenges they have experienced and critical issues that they have identified in cross-sectoral and cross-boundary work. One of commonly occurring themes were the problems associated with time horizons of hybrid evaluation and difficulties related to short term measurements in projects that focused on groundwork toward long-term outcomes. This finding was not exceptional and have been previously described in literature.

> "Somehow the continuity is currently not present at all."

Ebrahim, Battilana and Mair (2014) have discussed the same problem by stating that organisational outputs and activities are typically easier to measure compared to outcomes. Because causal links between activities and outputs are difficult to predict, organisations may rather focus on procedural instead of substantive accountability. This was perceived as one of the problems in current performance management in bio-sector hybrids by interviewed experts. Time horizons defined by funding body were considered short, and measurement of actual outcomes of collaboration difficult. Many of the hybrid organisations were at their early stages and aimed at creating long term impacts, but only their immediate effects were evaluated.

> " So at this moment many corporation have quite strict performance objectives, that the outcomes need to be seen very fast after the joint project has been started. Which is quite challenging, considering that many activities are quite research-oriented and results that can be readily commercialised cannot be instantly seen."

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Heterogenicity of measurement systems and need for new diagnostic tools

The inherent challenge in cross-boundary work is that each organisation employs different mechanisms to make sense of same information (Kunttu, 2017). “Information flowing through the network is likely to have different meanings, different uses, and different values for the individuals and groups receiving and using it” (Weber & Khademian, 2008, p. 337). Practices of measuring and evaluating performance are tightly linked with institutional logics. Different organisations have different conventions, and measurement instruments of a research institution differ significantly of those employed by a publicly listed company. Literature of hybrid organisations describes situations where in order to please every participant extensive auditing systems are put in place (Johansson & Vakkuri, 2017). In this study, none of the interviewed experts felt that this is the case but described difficulties in choosing measurement instruments or combining performance information and measurement data in a way that would be considered as useful across partner organisations. Organisations face ´the challenge of bundling´ as stated by one of the interviewed experts:

> “Measurements are very different in different organisations... and that… So, we would somehow need to combine and adjust them. And there we have this challenge of bundling.”

As a result, some of the partner organisations were engaging in activities that aimed at creating system-wide data and new, shared measurement instruments. The organisations were not necessarily aiming at unifying all performance measurement but creating new measurements that would complement existing performance management systems and at the same time aid in system-wide governance. These new diagnostics were used in creating goal congruence and were tightly connected with join goals. For example, one of the arrangements aimed at creating system wide metrics to measure environmental performance.

> “Our organisations, especially bigger ones, have their own sustainability metrics already in use. But we are trying to create system-wide metrics and reporting system.”

Along with heterogenicity of instruments and infancy of system-wide measurement, many experts problematised current measurements instruments suitability and value as diagnostic tools in multi-organisational, institutional complex settings. More phenomena-based assessment and impact assessment methods were called for.

> ” You cannot get behind the phenomena with current tools. How much the amount of investment or amount of jobs created really tells you? Something about the scale, obviously, but…. we need understanding of the phenomena and we need to be able to write it open for decision-making.”
>
> “The amount of businesses contacted, or amount of networking events arranged tells nothing about learning or accumulation of knowledge.”

Presentation and openness of data

Presentation, distribution and openness of data are widely described as critical issues in hybrid settings. Institutional logics are shaped and melded together in continuous interaction of organisations (Smets & Jarzabowski, 2013). Kunttu (2017, p. 37) states that “a remarkable amount of research on relational knowledge transfer regards knowledge accessibility as a major facilitator of innovation”. Risks associated with information sharing were identified by Kunttu (2017) as important considerations when drawing organisational boundaries, especially collaborative R&D contexts. At the same time, as earlier noted, institutional logics guide practices related to presentation and distribution of information. Some authors have described hybrid organisations as “a cooperative game with partner-specific communication” (Ménard, 2004, p. 7). The capacity for agile transfer of information has been identified as significant advantage of network organisations compared to traditional hierarchical and pure market structures (Weber & Khademian, 2008). Ménard (2004, p. 7) also notes that “Developing an adequate information system among partners is central to the survival of hybrids, but informational asymmetries also represent a major challenge”. Furthermore, innovation ecosystems are becoming increasingly global, and hybrid organisations ability to exchange knowledge independent from physical distance has been identified as an important capability (Valkokari, Seppänen, Mäntylä, and Jylhä-Ollila, 2017). Rajala, Laihonen and Vakkuri (2019) identified member organisations as information system silos as a significant challenge in hybrid performance dialogues their empirical study.

Interviewed experts identified openness and accessibility of information as a significant issue that affects both performance outcomes and performance evaluation of multi-organisational constellations. Institutional properties may prevent organisations from distributing information that would be crucial from the network perspective. As earlier noted, market logic favours controlled information distribution, and requires organisations to guard their intellectual property and reputation.

> "Publicly listed companies are not releasing any information before it is really highly developed and ready to be published. It would help public sector partners if selected pieces of information were more readily available."

Performance evaluation of a hybrid needs to be legitimatised in various partner organisations and for external stakeholders. As already noted, measurement instruments do not always readily fit together, and organisations have different interests and different perceptions on what is valuable (Johansson & Vakkuri, 2017). Interviewed experts noted that language and conventions of representing information varies, and adaptation are needed. Forms of information distribution, presentation as well as forms of distributing performance information become central questions in hybrid environment. Advantages in communication technology and decreasing costs in interorganisational information transfer enable and encourage cross-boundary work (Kunttu, 2017), but also provide tools that allow organisations to present information in new ways. The experts noted that new digital tools may help in distributing and presenting performance information in multi-organisational network settings in more engaging ways.

> "We used this digital impact assessment and communication tool in our project, and I know that few others use it too. In one of their presentations there was this screenshot of a WhatsApp message where somebody had sent a big file and the answer was TLDR "too long, didn´t read". I think it nicely captures how we have this information overflow that we need to constantly cope with, information is flowing for here and there and we need to be selective in what we dedicate our attention to."

> "We are trying to take it all into this digital platform."

However, some of the experts were concerned that currently little resources and time are budgeted towards finding new ways to represent data. Deeply institutionally embedded norms such as accounting and reporting conventions guide what is acceptable way to present performance-related information and results. Furthermore, few experts noted that

although digital instruments are great tools, they are just that: Tools. While others perceived digitalisation as a new opportunity, some experts were concerned with time and resource allocation. Few of the experts noted that currently digital tools and their use in reporting is not considered in resource allocation, and would cause additional workload.

> "It should be kept in mind that although various instruments like digital platforms can help, they are only instruments."

> "If reporting on wider audiences and digital ways to present information ignore or replace scientific reporting, this is a serious contradiction that can diminish research institutions interests towards working in hybrids. New ways to present information are very important for making scientific work known for wider audiences, and this challenges research organisations. It also requires more resources, because currently we are only able to reach the mandatory targets, and all beyond that is extra. At the moment researchers are strained by fund applications, which is why it is difficult to find time for combining and publishing the results and utilizing different digital tools."

6.5. Future of performance in cross-boundary hybrids

Delphi method was originally developed as method for forecasting the future and it has been extensively employed in futurology. The final chapter of this thesis is dedicated to speculation of what the performance in cross-boundary hybrids should and will look like in near future. Institutional properties of organisations taking part in multi-organisational collaboration, as well as institutional work done by individual actors, shape the way performance is understood in hybrid settings. The experts were asked how the performance management in hybrids settings should be arranged and what it should look like, and how organisations can overcome performance challenges. Most of the experts emphasised importance of open performance dialogues and information sharing as one of the most crucial elements in mediating between differences in institutional logics. Careful planning and structured communication processes were noted to aid in first of all acknowledging different performance objectives and in the other hand harnessing different logics in a way that improves and diversifies overall performance evaluation. In hybrid settings, importance of performance dialogues was highly emphasised. Shared measurement systems and concrete milestones were perceived as paramount. Transparency of measurements and progress and joint commitment of participants was also perceived as important factors. Legitimacy of the instruments across operations was perceived as essential.

> “It would be good to have common instruments that are being evaluated, it is important in order to keep the hybrid together, and they must be the type of instruments that they are in a way accepted by all parties and the parties recognise them in their own work.”

> “The more specific the targets are, the better it is to have concrete milestones that are controlled often, I do not know what the exact amount of time should be, but these kind of smaller milestones mids the project. So that we could see at all times if something is working or not, and we would not notice it in the end, that this was done all wrong. And that they would be concrete.”

Due to the central role of external financing in bio-sector, many of the interviewed experts felt that active involvement by the financier is necessary, and measurement instruments should be further refined to emphasise actual impacts instead of easily measurable quantitative results. Phenomena- and impact assessment were thought to have increasing importance. Time frames should be adjusted so that long-term impacts would be acknowledges, and continuity should be placed in more central position. Pooling resources does not pay off, if there is no continuity (Ménard, 2004).

> “Financing body should be more involved and steering the project towards greater impacts together with the executing bodies.”

> “Performance targets defined in project financing will be fulfilled, sure, but we should be able to create continuity – How we build this in the future and how we continue this work. Stopping the work after project financing ends is not the idea, and certainly this type of multidisciplinary network is a smart way to operate --- This should become integrated part of our daily activities, so that the practice continues no matter what the source of funding or any background arrangement is in place.”

Furthermore, collaborative performance and intangible processes within the hybrid system should be taken into account. Current metrics are not necessarily always sufficient and new measurements need to be employed. As hybrids develop and become more common, more attention should be paid on their performance. More research is needed on what aids and what distorts performance of a hybrid arrangement. Digital transformation and different tools and platforms can aid in reforming performance management to better fit in multi-organisational and cross-sectoral contexts.

> “We have this energy efficiency system that is voluntary and where organisations aim at reaching their energy saving goals. And there we have this annual reporting where different operators are reporting their results. And for a long time based on these results we combined 40-50 pages long report, which at the time was distributed as a printed version and pdf. Then we moved to online pdf and now we have started to create not only the report, but

also dynamic site with different graphs and result indicators, and short descriptions of what kind of activities have been undertaken in order to save energy. And all this can be downloaded into PowerPoint format. And then we utilise it much more, and also partners use it use it much more when they want to for example internally represent results and what type of actions can be undertaken in this sector, what is their payback time, and what others have done. The same work is essentially done, you spent little more on representation and usability of data explodes in completely new way."

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7. DISCUSSION

Ontological and epistemological ambiguities in hybrid research possess challenges when grounding hybridity as a concept into an empirical context. Hybrid organisation as a concept was not very well known among practitioners, and several interviewed experts required concept to be clarified and discussed. Although interviewed subjects were provided a short definition of what hybrid organisation means, understandings of hybridity as a phenomenon varied among the experts. Hybridity is typically understood in public-private axis instead of a combination of these two. This was reflected in expert discussions. Furthermore, hybrid ´organisation´ is a challenging concept because organisations in social sense may not be organisations in legal or structural sense: The notion of hybridity can be present in macro-, meso- and micro-level (Johansson & Vakkuri, 2017).

This study was explorative study on hybridity in a novel empirical context. The study covered heterogenous set of arrangements and aimed at identifying different hybrid forms and arrangements in bioeconomy context. Previous studies, for example Ebrahim, Battilana, and Mair (2014), have investigated the struggle with legal forms in public-private interface. Rajala, Laihonen & Vakkuri (2017) noted that structural features of partner organisations may in some cases restrain collaboration. Clearer understanding of bottlenecks and challenges, and what constitutes efficiently working hybrid operation, would enable organisations to work in more challenging environments. Aim of future studies should be on understanding how features of a hybrid enable or restrain collaboration. Currently, organisations have very little to work with, and there is growing interest towards the best practices and benchmarks as well as practical governance strategies. In this study, structural features were not considered, and study focused on hybrid issues in more general level.

The present study aimed at describing interplay of institutional logics in different levels. Experts described different practices, strategies, processes, systems and technologies, which were used in developing hybrid arrangements. Micro-foundations of the construction of institutional logics offer interesting points of departure for future studies. Boundary and epistemic objects in hybrid management are another interesting case. Materiality and shared

space were also brought forward by the interviewed experts as significant dimensions in managing complex organisations. Some of the experts felt that physical proximity that allows daily interactions in form of a shared working space helps in constructing joint activities. Study of materiality and different artefacts as signifiers of institutions, and how they shape and are shaped by institutional work, has been proposed by Lawrence, Leca and Zilber (2013) as a possible direction for future studies. Particular interest should be how these elements can aid organisations in combining different institutional logics together.

One of the key findings in this study was that external influence, and in particular influence of different steering mechanisms, is strongly present in bio-sector hybrid arrangements. Rajala, Laihonen and Vakkuri (2019) suggested that one of the directions for future studies would be how different funding methods shape hybrid organisations performance management system. In this study, the potential of financing instruments to steer hybrids towards suboptimal performance was noted. Project-based hybrid organisations that enjoyed large proportions of external funding were described to heavily rely on measurement instruments and performance targets determined by the financing institution. Nearly all experts were emphasizing the role of the financing in initiating cross-sectoral collaboration focused on solving sustainability challenges. Without sufficient steering and funding, as one of the experts stated, bioeconomy is ´like a large molecule that vibrates but does not move´. In project-based hybrids many of the experts felt that continuity of operations as well collaboration with other projects and external organisations should be paid more attention to, in order to avoid overlap and formation of a ´mausoleum of forgotten technologies and research´, as another interviewed subject stated. Yet another interesting point raised by the experts was that while work in hybrid interface may sometimes be complicated, implementation may be even more difficult deeper in any given partner organisation. Influence of hidden external institutional logics, legitimisation processing, and steering effects of external logics provide interesting points of departure for future research.

Performance was considered complex, situational and contextual. Experts noted that as hybridity becomes more common, more research is needed on how performance systems in multi-stakeholder settings can be orchestrated. Interviewed experts described current work that aimed at creating system-wide shared performance management, or specific areas where performance evaluation is shared, as well as attempts to create new diagnostic tools that would better fit in institutionally complex environments. Many of the interviewed

experts felt that measurement should focus more on impacts, phenomena-based observations, system-wide evaluation and quality metrics rather than quantitative data on progress, and that the organisations should develop more substantial accounting approaches. Experts also felt that climate objectives should be more deeply embedded into the systems and new diagnostic tools specific for bio- and circular economy developed in collaboration between different stakeholders. What was evident was that currently the arrangements relay on existing performance information generated by their autonomous bodies, and evaluation criteria was set by the financing body in many cases. This reflected prevalence of de-coupling and selective coupling as predominant approaches to plural institutional logics in hybrid arrangements. Many of the experts hoped that through new structured dialogical processes and digital tools organisations could create impact assessment that measurement overall system-level performance from multiple different perspectives.

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8. CONCLUSIONS

The aim of this study was to investigate cross-boundary and cross-sectoral interfaces and institutionally complex collaborative arrangements. The present study aimed at understanding dynamics of institutional logics in two different levels, by asking how institutional logics are present in bioeconomy development and what type of logics different bio-economy stakeholders possess (macro-level view), and how different and plural institutional logics influence situated critical governance processes such as goal setting and performance systems in bio-sector hybrid organisations (micro-level view)? The present study was explorative, in-depth qualitative analysis examining hybridity and hybrid organisations in bioeconomy context based on purposeful sample of selected experts.

Field-level institutional logics (logics of capitalist market, scientific research, regional development and environmental protection) are in constant interaction and blending with each other. Based on the consensus of interviewed experts, bio-sector is becoming increasingly hybrid, and institutional logics more entangled with each other. Collaboration across sectoral and organisational boundaries are driven by macro-level policies and steering mechanisms, politization of natural resources and increasing need to legitimize their use, resource-intensity of bio-based innovations, the growing need to pool resources in order to survive in international competition, as well as pursuit towards competitive advantage through relational rents and industrial symbiosis. Divergent types of arrangements were identified: Industrial symbiosis or hybrids organised around certain material flows, triple-helix innovation projects, and innovation platforms facilitated by keystone operators.

In micro-level, these hybrid arrangements need to deal with sometimes contradicting plural institutional logics. Goal congruence was perceived to be paramount for the survival of any given hybrid arrangement. Commonly mentioned challenges in joint goal setting were external influence, cultural distance between the partners, different time horizons, competitive tensions and territorialism between the partners, and lack of motivation. These results support findings from earlier empirical studies in different hybrid contexts. In ideal

type of hybrids, institutional logics complement each other. In practice, logics are rarely readily compatible. Organisations take different approaches when dealing with challenges that arise from institutional complexity. Selective coupling was predominantly discussed approach: Organisations used different institutional logics to meet different goals, but also de-coupled logics and made compromises between them. Different institutional logics were perceived to be in ideal case complementary, but idea that hybrid participation would result to creation of new operating logics in cross-boundary settings was not widely recognised by the interviewed experts. Institutional logics were thought to be a sum of the institutional logics present in the arrangement through the partners in one way or another. However, experts noted that different logics are increasingly present in their own organisations and impact daily operations. This leads to the question whether despite new logic not being formed in hybrids organisations that are in close interaction gradually become more institutionally diverse themselves.

Micro-foundations of institutional logics are evident in hybrids goals and control systems. Partner organisations, at least in the early stages of the process, usually can influence performance evaluation system and jointly negotiate system that best fits to their needs. The challenge is that there are not many frameworks or models that would guide executives in this task. Although performance management in hybrids was noted to be highly situational and contextual, mainly developed *ad hoc* to best fit the needs of a specific arrangement, critical issues were related to temporal dimensions of performance evaluation, procedural versus substantial approaches in evaluation, heterogenicity of performance metrics and systems in partner organisations as well as lack of diagnostic tools that would be suitable for multi-organisational settings, and to openness, presentation, and distribution of performance information. Digitalization will open new possibilities and was anticipated to transform the way performance information is distributed and used in multi-organisational constellations, but performance dialogues and coordinated communication practices will continue to have crucial role in melding different institutional logics together in a meaningful way and creating goal congruence.

Limitations of this study should be acknowledged when interpreting the results. It should be noted that due to the scope of the study and the small panel size, findings of this study cannot be generalized to cover bioeconomy or management of hybrid organisations in general. Instead, findings should be interpreted as in-depth insights and potential point of

departure for future studies. As cross-boundary hybrid arrangements are becoming more common in bio-sector, more attention should be paid on their governance and performance. Future research should investigate on what conditions collaboration works in different types of arrangements, and examine processes, frameworks, models and practices that could aid executives and practitioners in challenging task of orchestrating and governing hybrid operations.

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APPENDIX 1. Knowledge Resource Nomination Worksheet (KRNW) (1/1)

Disciplines or sectors	Organizations	Research and projects
PUBLIC SECTOR		
Ministries	the Ministry of the Environment (EM), the Ministry of Agriculture and Forestry of Finland (MMM), the Ministry of Education and Culture (OKM), the Ministry of Economic Affairs and Employment	Finnish Bioeconomy Strategy Bioeconomy Panel
Public Research Institutions	VTT (Technical Research Centre of Finland Ltd) Luke (Finnish Natural Resource Institute) Syke (Finnish Environment Institute)	LUKE Boreal Green Bioeconomy Programme CIRCWASTE (Syke)
Regional development	Regional Councils ELY Centres	ECO3 (Nokia) RDI2CluB Smart Chemistry Park Turku
Universities and higher education institutes	Aalto University University of Helsinki Tampere University University of Turku Univeristy of Oulu LUT University HAMK Häme University of Applied Sciences JAMK University of Applied Sciences TAMK University of Applied Sciences	BioHub (TAMK) Biobord (JAMK) BioPavvo (JAMK) Uusi Puu -Project (TTY, TAMK, VTT)
Innovation funds	Sitra (the Finnish Innovation Fund) Business Finland Academy of Finland	Bioinnovation programme
Public Private Partnerships (PPPs)	CLIC Innovation Ltd.	Pilots4u (CLIC Innovation) BEST Programme (CLIC Innovation
Government owned enterprises	Motiva	Finnish Industrial Symbiosis System (FISS) (Motiva)
PRIVATE SECTOR		
Publicly owned companies	Biohit Oyj (Biopharmaceuticals and medicine) Fortum Oyj (Bioenergy) Metsä Group (Forestry, pulp, paper, other bio-products) Stora Enso (Paper, biocomposites, bio-based materials) Neste (Biofuels) UPM-Kymmene Oy (Bio-based forestry products) Vaisala Oyj (Technology) Vapo	BEST Programme
Small- and medium sized enterprises	Listing from Biotalous.fi, Biotalouspaneeli, and member listings from the industry associations	Pilots4U
Hubs	Smart Chemistry Park (Raisio) ECO3 (Nokia) Plänet B (Äänekoski)	
Industry Associations	Bioenergia ry, The Bioenergy Association of Finland Finnish Bioindustries FIB MTK – The Central Union of Agricultural Producers and Forest Owners Metsäteollisuus ry Elintarviketeollisuus ry	National Bioeconomy Panel
THIRD SECTOR		
Non-profit environmental organisations	SLL (Finnish Nature Protection Agency)	National Bioeconomy Panel
Non-profit regional development organisations	The Baltic Institute of Finland	BSRStartS3

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APPENDIX 2. List of organisations represented in the study (1/1)

List of organisations interviewed experts presented:

Bioeconomy Institute, JAMK University of Applied Sciences

Bioenergia ry, The Bioenergy Association of Finland

BioPaavo Business Accelerator, JAMK University of Applied Sciences

Centre for Economic Development, Transport and the Environment (ELY-centre), Lapland

CLIC Innovation Oy/Ltd., Strategic Innovation Cluster of Bio- and Cleantech

ECO3 Business Park Nokia, Verte Oy

Elintarviketeollisuus ry, Finnish Food and Drink Industries Federation

Luke Finnish Natural Resource Institute

Plänet B, Äänekosken Kehitys Oy

Smart Chemistry Park, Turku Science Park Oy

VTT Technical Research Centre of Finland Ltd.

Background or modified interviews:

The Baltic Institute of Finland (Suomen Itämeri-Instituutti)

Tretorg AS

Tampere University

APPENDIX 3. INTERVIEW QUESTIONS (1/2)

DELPHI ROUND 1. RESEARCH QUESTIONS

Background information: Interviews were conducted in semi-structured and dialogical manner in two separate rounds. Interview questions were divided into different thematic areas and interviews followed same general pattern. All thematic areas were covered in all interviews, but since experts represented heterogenous set of organisations and divergent professional backgrounds, not all questions were equally relevant for all interview subjects. Order in which questions were discussed varied. Experts were given short basic definitions of key concepts (hybrid organisations, institutional logics). In the end of the interviews, experts were asked to freely comment, state their own opinions and discuss any related themes. Language of the interviews was Finnish, and questions were provided in Finnish. All experts were given questions before interviews, so that the experts had opportunity to familiarise themselves with question pattern. Interviews were executed as face-to-face meetings, Teams or phone interviews.

8.1. Thematic area 1. Hybridity of Finnish Bioeconomy

IQ1: How would you describe bioeconomy in Finland?

IQ2: How does hybridity present itself in Finnish bioeconomy?

Sub-Q: Is it something that typical for biosector? Examples of bioeconomy-related hybrids?

IQ3: What is the role of hybrid organisations in the filed?

8.2. Thematic area 2. Institutional logics in bioeconomy

IQ4: Can you identify how institutional logic influence goals setting in your organisation, or in hybrid organisations?

IQ5: What are the challenges you have encountered when different logics are combined?

IQ6: Do you think that hybrid organisations combine different instituional logics of different stakeholders, or form new type of institutional orders?

8.3. Thematic area 3. Goal setting in hybrid organisations

Q7: How shared goals are composed in multiorganizational constellations that combine different institutional logics?

Q8: How goals are defined when there are multiple stakeholders and accountabilities present? Do ownership or modes of financing impact goal setting?

Q9: Do goals in hybrid organisation differ from the goals in your own organisation? How can they be aligned or combined?

Q10: Can you think of practices, instruments of strategies used in cross-boundary goal setting?

8.4. Thematic area 4. Performance and performance evaluation

Q11: How would you describe current performance management in bio-sector hybrids?

Q12: Does performance systems of partner organisations impact performance evaluation in hybrid?

Q13: What type of instruments/modes of evaluations are used? Do they reflect multiplicity of institutional logics?

Q14: Who evaluates results? Does evaluation take place in your own organisation?

Q15: How performance systems in hybrid should be composed so that they would best serve common goals?

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DELPHI ROUND 2. INTERVIEW QUESTIONS

Background: Round 2. was executed as an email survey. In Delphi Round 2. experts received summary of results composed based on Round 1. interviews. Summary was five (5) pages long and was divided on four thematic areas as above. Summary presented key findings and statements in concentrated form. Experts were asked to comment on findings and answer additional questions related to results and interview themes. Commenting period was over one month long, and answers were provided in written form.

8.5. Thematic area 1. Hybridity of bioeconomy

IQ1: Comment the results from round 1. Do you think the summary provided above sufficiently described current state of bioeconomy in Finland? Is something missing from the results?

IQ2: How do you think hybridisation will transform the field in the future? Do you see hybridisation in your organisation?

8.6. Thematic area 2. Institutional logics

IQ3: Comment the results from round 1. In your opinion, do the above described institutional logics reflect the field, and how they are presented in bioeconomy? Is something relevant missing, or would you change something?

IQ4: Are these logics present in your organisation / does some of them describe your organisation? How they steer bioeconomy development?

IQ5: How these different institutional logics are present in hybrids? Are new logics formed, or are hybrids combination or sum of their partners logics?

8.7. Thematic area 3. Goal setting in hybrids

IQ6: Comment on the results from round 1. Do differences in institutional logics impact goal setting in hybrid organisations.

8.8. Thematic area 4. Performance systems in hybrid organisations

IQ7: Comment on the results from round 1. and statements. What is the future of performance systems in hybrids? How different institutional logics are combined in hybrid performance systems?